GAS JOURNAL

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WORKS COMMITTEES

TO give employees a wider interest in and a greater responsibility for the conditions under which their work is performed; to see that the regulations contained in agreements made by the national and area Joint Industrial Councils are carried out; and to prevent friction and misunderstanding, the Eastern Gas Board has accomplished a very satisfactory experiment in setting up Works Committees throughout the area, membership of which is so balanced as to give those employed in the many small works in the area an equal share in representation with those at the larger undertakings. As much care has been exercised in the choice of representatives of the management as in setting up the machinery for the election of the employees' representatives and in no case does the number of management representatives exceed that of employees' representatives. The chairman in each case is appointed by the management and the vice-chairman by the employees, and there are joint secretaries representing both sides.

Sir John Stephenson, who has had ripe experience in industrial relations, and the members of the board have approached the whole scheme on the basis that there is no need for either side to have any secrets which it must conceal from the other. The constitution states that matters to be dealt with by the works committees shall include (a) matters tending to stimulate and create greater interest in the efficiency and output of the board; (b) matters appertaining to the welfare, education, and training of employees; (c) questions relating to the health and safety of employees; (d) matters causing friction, or difficulties which may arise, and the best means of settling them; and (e) stimulation of interest in making suggestions for the improvement in method and organisation of work and also in connection with the operation of plant and appliances. This list of functions is not meant to restrict the scope of the committees but is intended as a framework around which their work may operate. The Chairman of the board has personally attended meetings of all the works committees and encouraged the employees' representatives to talk freely of their problems and to ask for information from the management side. The committees meet at monthly intervals and the presence of a third of the representatives from each side, together with the chairman or vice-chairman, is necessary to form a quorum. When an employee desires to bring a matter before the committee he reports it to his elected representative, who in turn passes the details to the joint secretaries to determine whether the question is appropriate for reference to the committee. The scheme is still in its early stages, but the impression gained from its operation so far is that the employees have shown under nationalisation an increased desire to develop the team spirit which, under the old order, was as patchy as the disproportionate size of the various undertakings in the area.

A FIELD TO TAP

THOUGH it is extremely difficult to determine what weight can properly be attached to a mass of statistics relating to domestic hot water supply in Great Britain just published by the Ministry of Works as 'National Building Studies: Special Report No. 8' (H.M. Stationery Office, 1s.), the gas industry will perforce study with special care and interest the report and the findings set out in it. It should be explained that the object of the series is to provide as far as possible a single and convenient source of information issued by Government departments on matters of technical interest to the building industry. The story goes back to 1942 when, at the request of the Minister of Works, the Building Research Board set up a committee to review existing information and practice and to make recommendations regarding the heating and ventilating of the buildings to be built after the war. For this committee the War-time Social Survey conducted an investigation which included a study of the provision of hot water in selected households. Then, in 1946, the Scientific Advisory Committee of the Ministry of Works expressed the view that a more intensive investigation into the question should be made. This view was endorsed by the Ministry of Health, the Department of Health for Scotland, the Ministry of Fuel and Power, and the Building Research Station of the D.S.I.R. A working group under the chairmanship of Dr. F. Yates, F.R.S., was set up by the Social Survey Panel of the Scientific Advisory Committee to study the problem, and after a pilot survey the Social Survey Division of the Central Office of Information was requested to carry out

a national survey on the subject. Such is the background of the present report to which we call attention. The work was done in March, 1947. A further report is to come on a survey during the summer of 1948.

The object of the enquiry was to determine the distribution of existing hot water appliances and facilities, the relation between the consumption and use of hot water and the appliances available, and the amount of hot water adequate for the average household. The survey covered 6,000 'representative' households (a household being defined as a group of people living in the same dwelling and sharing in the same housekeeping unit). The field work was carried out by Research Services, Ltd., a personal interview method of investigation being employed. The information was obtained solely from a housewife at an interview usually lasting some 20 minutes. We learn that the housewives were willing to talk. Even so, we suggest that more than a little discretion is required in interpreting what they had to say. Households were divided into five broad economic groups; both urban and rural districts were covered. And now for some of the results. The survey revealed that—taking, presumably, the 6,000 households as datum from which to generalise, which seems to us a highly questionable procedure—only 46% of the households in Great Britain have bathrooms; 15% of the households have no water heating appliance. One in four uses kettles and pans, either as the sole means of heating water for baths or to supplement an appliance; 9% use gas geysers (early forms and modern 'instantaneous gas water heaters'); and 21% heat bath water in the boiler of a solid fuel fired range with oven. To heat water for washing, 56% of households use kettles and pans; for washing clothes, 37% heat water in kettles and pans, 22% use a solid fuel copper, 28% a gas copper, 4% an electric copper, 18% a solid fuel range with oven, 4% a gas geyser. For dishwashing, 60% of households use kettles and pans, 22% a solid fuel range with oven, 6% a gas appliance, 5% an electric appliance. Solid fuel appliances (apart from the independent boiler) are less frequent in the south than in northern regions. That is part of the picture given in the report under review.

We turn now to housewives' opinions and 'complaints.' In the report tables are given showing the extent of satisfaction or dissatisfaction expressed by housewives on various appliances for different uses. Of the housewives who have solid fuel coppers, only about half are satisfied with them, compared with three-quarters of those with gas or electric coppers. Among the 'piped' appliances the electric immersion heater is considered satisfactory by the highest proportion of housewives (but only 4% of the households have electric immersion heaters). The independent boiler takes second place. The chief complaints about the other storage appliances are that the water takes too long to get hot and there is not enough at a time (many storage tanks are, of course, too small). Criticism was levelled at gas geysers. One in four housewives complained of having to run the water slowly, and opinion was voiced that the multipoint geyser is expensive and that geysers 'often need repairing.' As was to be expected, a much higher degree of satisfaction was found in the newer dwellings than in the older dwellings. In the highest income groups (over £10 weekly wage rate) the proportion of dissatisfied housewives is 17% in respect of bath water and 14% in respect of clothes washing. In the lowest economic group (up to £3 weekly wage rate—*i.e.*, households mainly dependent on a pensioner) the figures given in the report are 52% and 40%.

The foregoing gives an idea of the nature of the findings of this national survey—if, indeed, 'national' is correct in relation to a survey of 6,000 households; if, indeed, one is justified in generalising from the basis of such a small 'sample.' And in considering the 'complaints' it will be seen at once that comparisons are not very much to the point unless service rendered and on tap is taken into account. This comment applies with force to the use of 'gas geysers,' which are capable of unparalleled flexibility. But the report is once again unmistakable and vivid pointer to the untapped water heating field in Great Britain in the year 1950. Fifteen per cent. of households have no water heating appliances whatever; a further 28% of households have nothing but a copper. Thus 43% of all households must rely on a copper or on kettles and pans for all their hot water for no matter what purpose. Again the background of the survey and its obvious limitations and opportunities for mistaken interpretation must be borne in mind and taken into account. The extent of the field open to gas—and it is a highly competitive field—is the major factor which stands out beyond dispute.

'THE READINESS IS ALL'

ON March 23, 360 representatives of the North Thames Gas Board's Salesmen's Circles, which now number eight, took part in a full day's programme, spending the morning at the Ideal Home Exhibition, being entertained to lunch at the New Horticultural Hall, and later attending a prize-giving ceremony and an exhibition of new appliances and advance publicity at Caxton Hall. That is the bare outline of a function the underlying significance of which provided considerable food for thought. It started a chain of reflections which ranged from admiration for ambitions and effective planning to a further realisation of the unbalanced and even chaotic condition of our industry in some of its facets.

As is generally known, the Gas Light and Coke Company did not, of its own volition, participate in the family of Salesmen's Circles, sired by the B.C.S.A. and the B.G.C., which now languish under the silent protection of the Gas Council. It preferred to go its own way, creating discussion groups within its boundaries which neither sought nor received contact with salesmen from elsewhere. We always regretted that this view was taken, believing strongly in the elasticity and individuality of the Circles as originally instituted.

Initially anyone on the sales or service side was eligible for membership of the latter Circles, attendance was optional, programmes were planned by committees chosen from among ordinary members, and every effort was made to encourage intercourse with Circles elsewhere —a determination which culminated in the annual Salesmen's Days in London. This happy and, be it noted,

effective state of affairs obtained until nationalisation, since when the Circles have suffered uncertainty, lack of guidance, and division of thought among themselves. Their position at the moment is not happy. The annual meeting half promised last year has not materialised, and although we have reason to believe that plans are being made for their future, at the time of writing nothing has been revealed; it may be that the gathering of Chairmen and Secretaries on March 31 will shed some light on the matter.

The coming of nationalisation threw the North Thames Circles into peculiar prominence. Few will deny the tendency for Circles generally to conform to area board boundaries, and it is possible that the North Thames Circles may provide something of a model. At all events, the latter's activities on Thursday last invited a more than usually close appraisal.

The care which went into the planning of Thursday's event was everywhere apparent. Its atmosphere was one of genuine friendliness at and between all levels. This, one felt, was how a salesmen's gathering should be organised. (Mr. Michael Milne Watson had a phrase for it: 'It tastes like pre-war,' he said.) There were, moreover, distinguished visitors. Flanked on the Caxton Hall platform by a posse of North Thames dignitaries were Sir Edgar Sylvester and Colonel H. C. Smith. The afternoon's activities constituted part of a visit by Sir Edgar to the North Thames area, and this was itself part of a larger scheme in which he plans to visit every area. In this connection he remarked: 'The gas industry is built up in an unbalanced way.' While the Gas Light and Coke Company was a highly organised and integrated structure, it was not so elsewhere. (One misses the general level of achievement reached in this part of the world. It will be many years before areas reach the same level. You have a flying start, and a great advantage in that you are wonderfully well backed up on the research side.) Of salesmanship generally, Sir Edgar said that he knew his audience had suffered some discouraging and disheartening years; and they were not yet out of the wood. When, referring to appliances which were out of the reach of the consumer, due to purchase tax, Sir Edgar said, 'We shall do something about that,' did we detect in his voice a ringe of confidence? We should like to think so, for the imposition of excessive taxation on water heating and other appliances is surely the greatest frustration of all to the salesman today.

Our satisfaction at this mass meeting was considerable. It indicated genuine recognition of the salesman and the essential part he plays in the industry's affairs. The North Thames salesman has, we believe, an important place in the board's structure; he has both backing and background. But our satisfaction was tempered with the regret that this crowded Caxton Hall, listening to the Chairman of the Gas Council, was not filled with salesmen from all over the country, was not in fact a true Salesmen's Day, which it so much resembled. Sir Edgar had a final piece of advice for his listeners: 'The readiness is all,' he quoted. Such advice can hardly be needed in the North Thames area. There is no doubt, however, that it applies elsewhere.

PRESSURE HOLDERS

WE have of late devoted a great deal of space to pressure storage of gas. As example, last week's *Gas Journal* carried nine pages on the subject. In view of modern trends and the potentialities of gas nationalisation (if only interested people would stop grumbling and grousing politically for, shall we say, a month) we offer no excuse for concentrating on distribution problems. The nine pages to which we refer were reproduction of a paper given by A. G. F. Austin and A. H. O. Johnson, of Whessoe, Ltd., to the Western District of the Scottish Junior Gas Association. And, by the way, the Scottish Juniors have had an extraordinarily good session; their programme cannot have been excelled in former sessions throughout their history. Within a matter of weeks they have been addressed (and flattered) by Sir Andrew Clow, Chairman of the Scottish Gas Board and by Mr. J. H. Dyde, Deputy Chairman of the Eastern Gas Board and Vice-President of the Institution of Gas Engineers, whose forthright comments will be published next week. But we are digressing from the point of this note, the paper by Austin and Johnson. It was not in any way a 'hair raiser'; nor was it intended as such. But it is a most useful background to a comparatively new field of endeavour. The paper was divided into two parts, the first consisting of a general discussion of pressure holder installations and the economic considerations governing their operation; the second part consisting of a discussion of the engineering principles involved in the design, fabrication, and erection of pressure holders—and Whessoe knows something about all this. We were glad that the authors expressed their thoughts on the special problems which welding technique entails.

All engineers are aware that stresses set up in welded joints can be and often are retained. In certain circumstances such stresses may be accepted in straight butt joints. They do, however, constitute a distinct hazard in the case of heavy welds—for example, around manhole and branch compensating rings. At these points, even in a pressure vessel of riveted construction, there are, as the authors pointed out in their practical paper based on first-hand knowledge and experience, high local stresses. The shrinkage of heavy welds, however, may set up additional stresses. This condition has during the past few years been found to be in part the origin of certain welded pressure-vessel explosions in the United States of America, and subsequent examination of many installed vessels in that country has shown the existence of dangerous stress cracks.

The welding of fittings to pressure vessel shells should be followed by stress relieving. In practice the designer tries to locate the fittings all in one shell plate, or in as few plates as possible, so that a minimum number of plates with their fittings welded into position need be treated in a stress-relieving furnace. The authors seem confident that research work on this problem under the auspices of the British Welding Research Association will lead to a reduction of the welds sizes in the vicinity of openings, and so on with corresponding reduction of risk. Messrs. Austin and Johnson have given an insight into the problems involved in building a high pressure gasholder. The

finer points in the design and manufacture were touched upon in their joint paper, which concludes with the injunction that the reader should pay first attention and homage to the material which is ultimately to be shaped to form the vessel.

UNDERGROUND GASIFICATION

THE experiment on the underground gasification of coal at Newman Spinney, near Chesterfield, an account of which was given in the *Journal* of December 7, was the subject of a question in the House of Commons on March 13, when Mr. J. R. Robinson, M.P. for Blackpool, South, asked the Minister of Fuel and Power what progress had been made. Mr. Robinson also asked whether the Minister had reached any agreement with the American Government for the interchange of information on this subject in view of the completion in America of a similar project. Mr. P. J. Noel-Baker replied that the seam chosen at Newman Spinney was very suitable for the work; the necessary boring had started well, and while it was too early to forecast the result, there were good hopes that some, at least, of the complicated technical problems might be solved. As far as America was concerned, the Minister said that his experts had been present at the American experiments, observed everything, and had full information. He was sure that they would work closely with the Americans, as they hoped to do with the Belgians, and would do with the Russians 'if they would let us.' From other sources we learn that progress at Newman Spinney has been delayed by difficulties in boring a hole horizontally into a cliff-face left by an open-cast working. The experiment is now more than a month behind schedule, and it is anticipated that it will take another month to complete.

TRANSPORT COSTS

THE Minister of Transport, Mr. A. J. Barnes, informed the House of Commons on March 16 that the Transport Tribunal has recommended that the increased charges sought by the Transport Commission should be granted. As reported in the *Journal* of January 11, the Transport Commission has asked for authority to increase railway and canal freights by 16⅔% and to introduce increase in dock and harbour dues ranging up to 100% above pre-war. The object of the Commission in seeking this authority is to prevent a further substantial deterioration in its finances, and not remove the deficit of £25 mill. already existing. The Minister said that the Government were considering the repercussions of the Tribunal's recommendation before any final decision could be taken. He reminded the House that the proposed increase was largely for the purpose of paying the interest to stockholders of the railways; the sums did not represent the normal running expenses of the railways, or even wages. The alternative was that the taxpayer should meet the charges, because they were guaranteed under the Transport Act. In view of this statement it can be assumed that the Government will eventually decide to follow the recommendations of the Transport Tribunal. Domestic consumers can look forward with some misgivings to ultimate increases of approximately 4s. per ton in the price of coal and in the cost of gas to meet the additional £2 mill. a year, which, it was stated at the Transport Tribunal, would have to be passed on to the public if the freight rise was approved.

ADMISSION TO UNIVERSITIES

DURING the current month there has been much correspondence in *The Times* about education—a vital, perennial topic. On the question of admission to universities, the Head Master of Bradfield has been strongly—and, we think, aptly—criticised by Professor Paul G. Espinasee, University College, Hull. The Head Master of Bradfield is all out for 'firsts,' double firsts, polygonal firsts and the like, and he infers that the lesser fry (seconds, thirds, and also ran) would be unlikely to contribute to the welfare of the State. With logic (or childlike innocence) Professor Espinasse comments that it would be difficult to produce a number of firsts without producing at the same time a greater number of seconds and thirds. And he argues, rightly, that the seconds and thirds will become schoolmasters, or equivalent, serving the State. In his letter to *The Times*, Professor Espinasse was, to say the least, guarded, but he added: 'If we think too exclusively about our firsts, are we not in danger of finding ourselves in the difficulties encountered by any religion which is so preoccupied with saints that it cannot think of anything constructive to do with sinners?' Another letter in *The Times* was from Dr. Maxwell Garnett, written in the quiet atmosphere of the Athenaeum, but hammer-like striking a nail. He is concerned with equality of opportunity and he roundly asserts that local education authorities should not offer scholarships to universities so as to give equality of opportunity to everybody. How right Dr. Maxwell Garnett is. We quote from his letter to *The Times*: 'Such a practice not only deprives some of their most promising young people of the best and highest education, but it also slows down national progress and so harms every ordinary citizen. On the other hand, everybody stands to gain when the very best education, at school as well as in the university, is given to the very few whose outstanding qualities—moral and physical as well as intellectual—fit them to profit by it: what everybody needs is equality of opportunity for equally gifted adolescents from all income levels and from all social classes.' Junior gas engineers have foremost in their minds whether it is worth while spending a few of their years of life—it may for certification purposes be only a matter of five or seven years—studying. The answer is either yes or no. The consequences of the decision taken may or may not give individual satisfaction.

Letters to the Editor

HEAT AND WATER VAPOUR IN CRUDE GAS

DEAR SIR,—Mr. F. E. Craddock's paper to the London and Southern Junior Gas Association on 'Heat and Water Vapour in Crude Gas' (*Gas Journal* of March 8, p. 587), recalls Dr. Charles Carpenter's contribution to this subject in his paper 'Further Experience with Reversible Condensers' to the Southern Association of Gas Engineers and Managers in 1901.

In that paper, Dr. Carpenter narrated his experience with an old condenser which had been converted and made reversible by him at the Bankside works of the South Metropolitan Gas Company. The benefit derived from this system of operation was considerable and it has, I believe, been adopted as standard practice in many gasworks.

But much of Carpenter's paper was devoted to a study of the physical heat content of crude gas in relation to condenser design. One of the problems dealt with was the determination of the quantity of heat to be removed from 2 mill. cu.ft. of gas as measured in purified condition and at N.T.P. when that volume was expanded by heat and increased by the addition to it of impurities and by water vapour normally present in crude gas. At a temperature of 140° F., the temperature of the cooled gas being 60° F.

The gas was produced from coal carbonised in horizontal retorts. It may be mentioned here that at that time verticals, chamber ovens, scrubber standpipes, and steaming were developments for the future. Even water gas plants as we know them now were in their infancy and many gas undertakings had not adopted them.

On the assumption that crude gas at the inlet to condensers was saturated with water vapour, it was calculated that some 25,430,860 B.Th.U. would be removed from the gas in cooling from 140° F. to 60° F., and of this quantity about 21,710,000 B.Th.U. were latent in the water vapour. But that assumption did not go unchallenged and it became necessary to establish it by experiment.

The experimental apparatus at that time was in principle the same as that described by Craddock, but in all particulars it was different. It was much more robust, being almost entirely of metal. In form it was a miniature portable condenser. Vertical tubes of thin copper, through which a portion of the crude gas passed in a downward direction, were enclosed in a metal shell into which ice-cooled water passed and flowed in the opposite direction over the outer surfaces of the tubes. The tar and water condensed in the tubes was collected in an easily detachable glass vessel provided for the purpose. The ice-cooled water was supplied from a tank in which salt and ice were put in sufficient quantity to reduce the temperature of the water to about 35° F. An important part of the apparatus

was the provision of discs attached to long rods that passed through stuffing boxes in the top cover plate of the condenser. From time to time during the run of the experiment these discs were pushed down the tubes to clear them of tar and naphthalene. In this way rapid transmission of heat was ensured. Normally the discs were a little above the top of the tubes. Many tests were made with this apparatus with inlet temperatures varying from 130° F. to 150° F. The crude gas passed into the condenser at about 25 cu.ft. an hour for about three hours. The outlet temperature of the gas was of the order of 35° to 40° F. The liquified products were taken to the laboratory where the water content was determined and from which the aqueous condition of the crude gas was calculated. The cooled gas before entering the meter was purified in vessels provided for the purpose.

The question will no doubt be asked by what means was the crude gas induced to flow through the apparatus? The answer is it flowed under the head of pressure existing in the main at the inlet of works condensers.

In an earlier paper on 'Gas Exhausting and Condensing,' Dr. Charles Carpenter gave his reasons for placing the exhauster before the condenser. That paper was presented to the Southern Association of Gas Engineers and Managers in 1895.

It may be thought a little pointless thus to hark back to work of 50 years ago, but it is, I think, of some historical interest and not entirely unworthy of notice. It shows that there were gas engineers in that now almost forgotten past who were not so very far behind the moderns in their approach to practical gasworks problems of their time.

One word in conclusion. The figures I have quoted from Carpenter's 1901 paper were a little later slightly amended, due to the fact that soon after its publication more up-to-date physicals constants came to hand which made some correction necessary. In a well preserved notebook in my possession the original and the revised figures are entered. The total heat as given in Dr. Carpenter's paper was altered from 25,430,860 to 26,520,336 B.Th.U.

The total heat based on Craddock's figure is 27,000,000 B.Th.U.

Yours faithfully,
DEAN CHANDLER.

14, Calais Gate,
Myatts Park, S.E.5.
March 22, 1950.

USE OF THE WOBBE INDEX

DEAR SIR,—In your valuable and judicious editorial comment on my paper in your issue of March 17, you observe that 'after all, the Wobbe Index is directly as the C.V. and inversely as the root of the specific gravity, so that as in any case the C.V. is as constant as practicable, it comes down to keeping the specific gravity within a suitable tolerance.'

I should like, if I may, to point out that it was not my intention that further restrictions should be imposed on the gas engineer, who cannot possibly keep to close limits of specific gravity if he is using water gas for peak loads and is maintaining a constant calorific value. I intended to suggest rather that the C.V. should be allowed to vary in such a way as to maintain a constant Wobbe Index no matter how much the specific gravity fluctuated. The dead straight line on the calorimeter chart is only of theoretical interest if the specific gravity varies widely. Moreover, if the C.V. were allowed to rise and fall with the specific gravity, there would be less trouble arising from the lighting-back of aerated burners when a large proportion of carburetted water gas added.

May I take this opportunity of correcting two minor errors in the diagrams illustrating my paper?

In Fig. 5 a square point has been omitted which should be labelled S and should be situated at 650 W.I. and 20 A.T.B. There is also a point missing from Fig. 7 which should be a triangle at 1,000 W.I. and 12.6 in. flame length.

Finally, when I wrote the paper I had not been able to get hold of the original publications of Mr. Knoy in the American paper *Gas*, and I think I did him rather less than justice in my reference to his formula. This certainly seems to be an improvement on the Wobbe Index for the high C.V. gases distributed in California, though whether it would be as useful in this country is open to doubt.

Yours faithfully,
LESLIE T. MINCHIN.

25a, Thurlow Road,
London, N.W.3.
March 21, 1950.

Personal

Councillor **R. N. E. Hinton** (Watford) has been appointed a member of the Eastern Gas Consultative Council in place of Alderman T. H. Simmons, who has resigned.

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Mr. **Alex. Kennedy,** F.C.I.S., who for the last 4½ years has been associated with G. L. Howarth & Co., Ltd., Burnley, makers of the 'Rapid' washing machine and other appliances, has been appointed Sales Manager of the Company.

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Mr. **A. A. Bishop** has been appointed Sales Manager (Southern Area) to Morley Products (Padiham), Ltd. He was until recently representing Bratt Colbran, Ltd., in London and the South of England and prior to that held a number of positions in the gas industry, including that of Deputy Engineer and Manager to the Bexhill undertaking.

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Sir **Robert Sinclair,** K.C.B., K.B.E., President of the Federation of British Industries, was nominated on March 8, at a meeting of the F.B.I. Grand Council, for a second year of office. This nomination, which was unanimously approved, will come before the annual general meeting of the Federation next month.

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Mr. **R. Fill,** Northern Sales Manager of Smith Meters, Ltd., is now in control of the Leeds works department at Beeston. The scope of this depôt has been widened to ensure supplies of both domestic and industrial meters being readily available to meet requirements of the Northern, North Western, North Eastern, and East Midlands areas for quick delivery.

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Mr. **R. S. V. Barber,** B.SC.(ENG.), M.I.STRUCT.E., M.SOC.C.E. (FRANCE), has joined H. B. Concrete Co., Ltd., as Technical Consultant to the Board of Directors. Mr. Barber has, for many years, been engaged technically in the development of pre-stressed concrete and has made a large contribution to the British Railways in their investigation and use of pre-stressed concrete in their reconstruction programme. He has also undertaken much research into the commercial use of pre-stressed concrete, on the production of which it is the company's intention to concentrate.

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In our personal column last week we announced the appointment of Mr. T. S. Ricketts as Assistant Distribution Engineer to the Wales Gas Board, stating that at one time he was Works Engineer at Hertford. In fact, Mr. Ricketts was Assistant Works Engineer at Hertford, leaving to become Works Engineer at Hitchin. Mr. G. W. Brighten has been Works Engineer at Hertford since 1940.

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WEST MIDLANDS APPOINTMENTS

The following recent appointments have been announced by the West Midlands Gas Board:

Area headquarters: Assistant in Chief Accountant's Department, R. J. Powell. Chief Clerk, Coke Department, D. C. Shaw, formerly Clerk to the Joint Coke Committee.

Dudley Division headquarters: Senior Audit Assistant, E. B. Trotman, formerly Chief Audit Clerk, Dudley District.

Walsall Division headquarters: Senior Assistant to Divisional Accountant, R. Jackson, formerly Deputy Commercial Assistant, Widnes. Chief Cashier, G. Stride, formerly Senior Accountant Assistant, Borough Treasurer's Department, Oldbury. Walsall Group: Senior Accounting Assistant, F. J. D. Higgins, formerly Clerk to the Divisional Accountant, Birmingham. Cannock Group: Senior Accounting Assistant, L. Cater, formerly Secretary, Cannock District. Walsall Group: Senior Cost Clerk, M. R. Whitehouse, formerly Deputy Com-

mercial Assistant and Fittings Superintendent, Walsall District.

Coventry Division headquarters: Deputy Divisional Accountant, L. T. Drew, formerly Commercial Manager, Coventry District. Cashier, D. A. R. Collier (Chief Clerk and Cashier, Hinckley District). Principal Accounting Assistant, I. S. Prater, formerly Secretary and Assistant Manager, Leamington District. Senior Costing Assistant, A. L. White, formerly Senior Cost Clerk, Coventry District. Senior Accountancy Assistant, A. R. Avery, formerly Private Accountant. Stores Controller, J. O'Hara, formerly Assistant in Divisional Office. Deputy Chief Clerk, H. Bivins, formerly Senior Clerk, Coventry.

Worcester Division headquarters: Accountancy Assistant to Divisional Accountant, K. C. Craner, formerly Clerk, Redditch District.

Shrewsbury Division headquarters: Senior Assistant to Divisional Accountant, B. E. Causer, formerly Senior Audit Assistant, Warwickshire Division. Senior Rentals Assistant, E. Roberts, formerly Accountant, Shrewsbury District. Purchase Assistant, J. Onions, formerly Works Clerk, Shrewsbury District. Costing Assistant, J. Collins, formerly Chief Wages Clerk, Smethwick District. Stores Assistant, E. R. Ryder, formerly Storekeeper, Swan Village Works.

Stourbridge: Cashier and Chief Clerk, B. Green, formerly Chief Clerical Officer, Stourbridge. Distribution Superintendent, D. Dawson, formerly Distribution Assistant.

Birmingham: Chemist, Swan Village Works, J. A. Clayden, formerly Assistant Works Chemist, Saltley Works, Birmingham. Chemist, Central Laboratory, E. R. Forlin, B.SC., formerly Lever Brothers, Port Sunlight.

Leamington: Chief Clerk, G. E. Quayle, formerly Assistant Chief Clerk, Leamington District.

Hinckley-Atherstone Group: Chief Clerk, A. E. Blower, formerly Solicitor's Clerk, Atherstone.

Obituary

Mr. **Thomas D. Sutcliffe,** Joint Managing Director of Richard Sutcliffe, Ltd., Horbury, Yorkshire, and of the Sutcliffe Moulded Rubber Company, Ossett, Yorkshire, died at a Bradford nursing home on March 19.

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Mr. **W. H. Mees,** who had been with J. H. Robinson & Co. (Liverpool), Ltd., for 30 years as Yorkshire Representative, died on March 11 after a short illness. Mr. Mees was well known in the gas industry and will be missed by a wide circle of friends.

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Mr. **Gilbert Surtees,** who had been Engineer, Manager, and Secretary of the Uttoxeter gasworks since 1925, died on March 16. He was 56 years of age, and entered the gas industry in 1910. After serving as a pupil and technical representative of R. & J. Dempster, Ltd., for 10 years, Mr. Surtees returned to North Staffordshire to take up the position of Works Manager with the Fenton gas undertaking. His health had been indifferent for some time, and gave grounds for anxiety after a further seizure a few weeks ago. His kindly disposition made him a deservedly popular gas engineer.

In the report by the Home Office Section, Explosives Research and Development Establishment, Woolwich (an appendix to the main 73rd annual report of H.M. Inspectors of Explosives covering the year 1948), it is stated that the safety arrangements for experimental installations using acetylene at pressure up to 20 atm. gauge have been discussed with members of the proposing firms and also for large plants reacting acetylene for the purpose of producing plastics in large quantities. This has involved the examination of plant design in considerable detail, including the assessment of hazards associated with the use of some organic peroxide catalysts. The production of an autoclave for the examination of acetylene reactions at pressures up to 20 atm. gauge is proceeding.

Diary

Mar. 30.—Women's Gas Council: Joint Meeting of Branches, Gas Industry House, 3 p.m.

April 1.—Scottish Junior Gas Association (Eastern District): Paper, T. B. Livingstone, Perth.

April 3.—Society of Engineers: 'Some Aspects of Gas Supply' (with lantern slides and exhibits), E. C. LeJeune, M.S.E., M.INST.GAS E., M.SOC.C.E. (France), Geological Society Rooms, Burlington House, 5.30 p.m.

April 4.—Southern District 'B' Salesmen's Circle: 'Solid Smokeless Fuels,' Dr. F. J. Eaton, Coke Development Officer, North Thames Gas Board. Portsmouth, 2.30 p.m.

April 5.—London and Southern Junior Gas Association: Visit to Shell Refineries, Shell Haven, Essex.

April 7 (Good Friday).—North British Association of Gas Managers: Spring Meeting, Ardrossan.

April 14.—Institution of Chemical Engineers: 28th Annual Corporate Meeting, May Fair Hotel, Berkeley Street, London, W.1, 11 a.m. Annual Dinner, Ball Room, 7 for 7.30 p.m.

April 14.—London and Southern Junior Gas Association: 'The Application of Electrical Equipment in the Manufacture and Distribution of Gas,' H. F. Buxton, B.SC. Lecture Theatre, North Thames Gas Board, 178/180, Edgware Road, London, W.2, 7 p.m.

April 14.—Scottish Junior Gas Association (Western District): Annual General Meeting. Royal Technical College, Glasgow, 5.30 p.m.

April 18.—Midland Junior Gas Association: Annual General Meeting. Birmingham.

April 19.—Manchester District Junior Association of Gas Engineers: Joint Meeting with Yorkshire Junior Gas Association. Visit to Clayton Son & Co., Ltd., Leeds. Papers, 'The Design, Construction, and Maintenance of Gasholders of all Types.' Leeds.

April 20.—Midland Association of Gas Engineers and Managers: Luncheon, 12.45 p.m.; Annual General Meeting, 2.30 p.m. Queen's Hotel, Birmingham.

April 20.—Scottish Junior Gas Association (Western District): Evening Visit to Mossend Works, Fertiliser Section, Imperial Chemical Industries, Ltd.

April 21.—London and Southern Junior Gas Association: Reception and Dance.

April 22.—Eastern Junior Gas Association: 'The Drying-out and Lighting-up of Vertical Retort Installations.' A. D. Duxbury. Bishops Stortford.

April 25.—Southern Association of Gas Engineers and Managers (Eastern District): 'Works Accident Prevention,' F. A. Sanders. Gas Industry House, 2.30 p.m.

April 25.—Wales and Monmouthshire Junior Gas Association: Annual Meeting. Film (and discussion) presented by Vacuum Oil Co., Ltd. Porthcawl.

April 26—London and Southern Junior Gas Association: All-day Visit to gasworks and industrial works at Reading.

April 27.—Midland Junior Gas Association: President's Day. Oxford.

April 27.—Institute of Fuel: Annual General Meeting, Connaught Rooms, Great Queen Street, 11 a.m. Presidential Address of Dr. D. T. A. Townend. Annual Luncheon, 1 p.m.; principal guest and speaker, Sir Harold Brown, G.B.E., K.C.B., Chairman, Fuel Research Board.

April 29.—Western Junior Gas Association: Annual General Meeting. Bath.

May 4-5.—Eastern Association of Gas Engineers and Managers: Spring Meeting, Felixstowe.

May 18-19.—Wales and Monmouthshire Association of Gas Engineers and Managers: 45th Annual Meeting, Tenby. (First day social functions; second day business).

Meter Policy in the North West

COLONEL W. M. CARR, Chairman of the North Western Gas Board, attended a meeting of the North Western Gas Consultative Council at Liverpool on March 9 and replied to questions raised in what the Chairman of the consultative council, Councillor **C. E. P. Stott,** described as a 'whispering campaign' regarding relations between the area board and the directorate of Begwaco Meters, Ltd.

Before Colonel Carr's arrival, Councillor Stott told the council that a deputation of trade union representatives had been to see him and had made certain assertions. One was that a particular meter was being forced on the various undertakings against the desire and contrary to the advice of the responsible local officials. In view of the seriousness of the statements a meeting of all the parties concerned was arranged. In addition to union members, two Members of Parliament were present and the Ministry of Fuel and Power was represented.

Colonel **Carr,** on his arrival, told the council that neither he nor any member of the staff or employee of the area board had any association with Begwaco Meters, Ltd. The enterprise was originally started by the United Kingdom Gas Corporation, of which it was intended to be a subsidiary. The aim was to develop a meter of greater precision than had previously existed. Proposed just before the war, the development was held up until after the end of hostilities, and then there was the announcement of nationalisation. Meanwhile, the meter factory was in process of erection and development was proceeding.

The Government and the Ministry took the view that the United Kingdom Gas Corporation ought not to raise the new capital necessary to pay for the factory. The original expenditure of £30,000 had been provided by the United Kingdom Gas Corporation before the nationalisation of the gas industry was decided upon. The capital had to be raised elsewhere, except the original holding which, with other assets of the United Kingdom Gas Corporation, became vested in the North Western Gas Board. The North Western Gas Board was therefore now a shareholder in the company by reason of the vesting of that asset to the extent of £30,000.

Colonel Carr added that he resigned from the chairmanship of the company on taking up the chairmanship of the area board, and Mr. W. Hodkinson also resigned his directorship on becoming an officer of the area board.

In a subsequent discussion on prepayment meters, Colonel Carr told the consultative council that in view of the changed values now ruling it was the intention of the board gradually to substitute silver coin meters for copper coin meters. Thousands of the latter type were capable of many years' service, and consideration would be given to cases of hardship. The board, he said, had placed orders for tinplate meters very much in excess of the purchases by the separate undertakings in past years and much in excess of the total number of Begwaco meters available. Workers engaged in the repair of tinplate meters who might in the course of time become redundant would be offered employment with the area board.

A member of the council asked if meters could be made less cumbersome and more adaptable for the housewife to keep clean, and another member enquired whether the board would consider the setting up of a meter cleaning service.

Colonel Carr replied that the Begwaco meter was much smaller and more adaptable than the normal type. Meter cleaning services were already operating in certain areas, and he saw no reason why, in the course of time, such services should not be extended.

Eastern Hire Purchase Problems

QUESTIONS on hire-purchase terms for gas appliances were discussed at a meeting of the Eastern Gas Consultative Council at the Connaught Rooms, London, on March 20, under the chairmanship of Alderman R. Turner.

The **Chairman** recalled that the Hatfield Rural Council had expressed a fear that tenants of council houses would find five-year terms for the hire-purchase of gas cookers too heavy a burden. The consultative council had suggested to the area board the possibility of spreading payments over ten years. The board had replied that with the exception of the Watford division there had not in the past been any demand for terms extending beyond five years, but people in the very low income group were finding difficulty in keeping up their payments and the board had therefore decided to establish a seven-year rate for Watford and Luton. It was deemed unwise to grant terms for so long a period as ten years.

In reply to a lady member who enquired what was the life of a cooker, the Chairman said he could not give a definite answer. It would be almost as easy to state the life of a lady's dress—so much depended on changes in fashion. In answer to another question he said that while existing agreements were being honoured no new simple hire terms were being granted for gas cookers.

Complaint was made by a Felixstowe consumer of the high interest charged on a refrigerator sold to him on hire-purchase terms. It was explained that the whole transaction was somewhat unusual in that while hire-purchase terms were usually not granted for the particular type of appliance the consumer had made an initial payment of about one-half the total cost, leaving the balance to be paid over a period of two years. He claimed that he should be charged interest only on the amount outstanding, and not on the total price of the appliance.

The Chairman undertook to take the matter up with the area board.

The consultative council had been in correspondence with the Eastern Electricity Consultative Council on the desirability of arranging for the joint reading of gas and electricity meters. While the two councils were agreed in principle it was felt that the time was not opportune to introduce such a system, but that the whole matter should be reviewed as early as circumstances permitted.

Letters were received from the Sheringham and Halesworth Urban Councils criticising the prices charged for gas in their respective districts. The Chairman explained that the whole question of the equalisation of gas charges had been discussed by the area board. It was the board's ultimate aim to achieve some measure of uniformity, but no immediate steps could be taken. The Sheringham Council was apparently still not satisfied, and asked why Sheringham should pay a higher price than Cromer.

The Chairman said the general linking up of works where gas charges were high was at present impracticable, but in due time the board hoped that the strong would be able to help the weak, particularly where gas charges were abnormally high and not competitive with other fuels. Variation of gas charges was a problem of many facets and the board did not propose to make any general revisions until it had had an opportunity of a more careful examination of revenue and expenditure.

It was reported that the five divisional committees had held their inaugural meetings and appointed their chairmen and deputy-chairmen. The Chairman of each committee presented a short report on the proceedings at those meetings. In each case the Divisional General Manager had attended and given a general outline of the services available.

Complaint of lack of maintenance to consumers' appliances at King's Lynn was discussed and the Chairman reported that he had been in communication with the gas board, who stated that this was due to the shortage of fitters, which in turn was due to the housing shortage. They also stated that enquiries were being made into the position and hoped to give the council something more definite at an early date.

Coal Output for the week ended March 18 totalled 4,361,100 tons, against 4,378,200 tons for the previous week and 4,346,500 tons for the corresponding week of 1949. Manpower declined by 400 to 704,800 in the week ended March 11, the corresponding figure a year ago having been 726,900. Gas available at gasworks in the week ended March 17 was 11,462 mill. cu.ft., compared with 11,664 mill. cu.ft. in the previous week and 11,625 mill. cu.ft. in the corresponding week of 1949. Solid fuel fired power stations sent out 1,023 mill. units of electricity in the week ended March 17, against 1,002 mill. units in the previous week, and 967 mill. units in the same week of 1949.

Gas and Hard Currency

MR. G. LE B. DIAMOND, C.B.E., Chairman of the West Midlands Gas Board, speaking at the fifth annual luncheon of the Midland Wholesale Coal and Coke Traders' Association, at the Queen's Hotel, Birmingham, on March 21, gave details of impending important developments in gas manufacturing plant in the area under the control of his board.

Mr. **Alexander Comley,** in proposing the toast 'The West Midlands Gas Board,' referred to the happy relations which subsisted for so many years between the distributive sides of the coal industry and the Birmingham Gas Department, due to the sympathy and understanding with which Mr. Alexander Lee had regarded the difficulties which from time to hime had beset their path. They offered a collective welcome to Mr. G. le B. Diamond in his capacity of Chairman of the West Midlands Gas Board and promised to co-operate in the tasks he had to perform. The gas industry was one of the oldest in this country, but it was junior by centuries to the distribution of coal which, in early days, was carried out with packhorses and primitive carts. Time was when the distributor, by attending any markets from Newcastle to Swansea, armed with nothing more than half a sheet of notepaper and a pencil, could enter into commitments for the purchase of coal sufficient to keep an office staff engaged for long. Those days were gone beyond recall.

Towards the Future

Mr. **G. le B. Diamond,** responding, reminded those present of the size of the organisation which the West Midlands Gas Board had to administer. Geographically, the area covered Shropshire, Staffordshire, Warwickshire, and Worcestershire, an area of 5,000 sq. miles, with great industrial and manufacturing concerns producing approximately 30% of the exports to the hard currency countries. Gas was largely used in producing many of those exports, particularly in those relating to the metal industries. The population of the West Midlands area was approximately 4 mill. and the amount of gas absorbed annually was about 56,000 mill. cu.ft. By far the largest amount of gas for industrial purposes sold in the whole country was sold by the West Midlands Gas Board, amounting to 25,000 mill. cu.ft. per annum, with a total money turnover of £25 mill.

The Board had a considerable programme of enlargement of plant and construction of new works. Many of those projects were initiated by the former owners. All had been re-examined to see if the proposals fitted in with the Board's plans for the subsequent integration and development of the area as a whole. There were 21 major projects in hand for increasing the manufacturing plant The cost of this item would be £8,437,000. Among those projects was a gas turbine electrical generating plant which would be the first one of its kind in the country, would be in a gasworks at Coventry and would be operated entirely by waste heat. In addition, 11 new gasholders were under construction with a capacity of 24 mill. cu.ft. If, said Mr. Diamond, that output were concentrated in one gasholder, the latter would be large enough to contain the whole of the Council Chamber of Birmingham and the Town Hall as well.

The board, he continued, spent no less than £9,600,000 a year on coal, the bulk of which was derived from the West and East Midlands; a certain amount came from Yorkshire. Approximately 65% was purchased through other boards, and 30% through the National Coal Board. In common with other industrial undertakings, they were concerned with the quantity of inert material sold as coal. Mechanisation at the coal face was the only solution in maintaining output at a time of declining manpower in the mines. But there was writing on the wall—a grave warning on the question of declining manpower. Anybody could see this for himself in the *Monthly Digest of Statistics* issued by the Government. This decline was vital; it affected the well-being of the country. The coal cutter at the face and the band conveyor did not discriminate between rock and coal. The only solution lay in cleaning by mechanical or wet methods at the pit bank. The Coal Board told them in an interesting and comprehensive report what it was doing to overcome the problem. It was serious indeed when it was realised that in the area of the West Midlands Gas Board the average increase of inert material since 1938 was nearly 2%, equivalent to an annual tonnage of 64,000 of ash which would fill 5,333 standard railway wagons.

Mr. Diamond went on to explain that his board had set up a coke department. Of course, much remained to be done in the grading and handling of coke before they could be satisfied that the needs of the consumer and the merchant were adequately met. The quantity of coke produced for sale in the area was 1,067,000 tons. From the retail merchants' point of view and from the gas board's angle, the general public could help the situation if they would stock coal and coke during the summer months. Broadly, however, the West Midlands Gas Board was confident that considerable progress had been made in establishing on a sound basis mutual arrangements for handling coke supply problems.

Gloom and Hope

The toast, 'The Midland Wholesale Coal and Coke Traders' Association,' was entrusted to Mr. **William C. Ramsay** (Chairman, Railborne Coal Factors' Association), who paid a tribute to the National Coal Board for having carried out a difficult job with ability. His Association, on the other hand, had suffered grievous losses in that much of its trade, which they had looked after for many years, was swept away even overnight with no acknowledgment of services rendered. This had obviously caused distress and gloom among the Association's members, but he had not lost hope. Distribution, continued Mr. Ramsay, was an essential part of the industry. Although the National Coal Board shouldered heavy responsibilities, he did not think they would ever be able to deal with the ramifications of the individual consumers in all parts of the country. His Association was able to continue to perform the duties incumbent upon distributors; it only asked for reasonable payment for its services. Both the N.C.B. and the national gas industry understood the difficulties. If only both could tide over the current period of political uncertainty, both would emerge with flying colours.

Illuminating Engineering Society

The Illuminating Engineering Society announces that its summer meeting will take place at Buxton from May 16 to 19. The technical papers to be presented are all of a practical nature and will have a wide appeal not only among lighting engineers, but among many others interested in particular aspects of lighting. The papers include 'Floodlighting,' by R. O. Ackerley; 'Lighting of Fibre and Fabric,' by H. Hewitt; 'Stage Lighting in the Post-War Theatre in Great Britain,' by L. G. Applebee, and a paper by J. M. Waldram on 'Street Lighting,' which will take the form of a survey of current practice.

North Thames Posters

Future plans of the North Thames Gas Board include the continuation of the 'Cooking by Gas' campaign for another six months. A new series of posters has been prepared by Gilroy. The above shows one of these posters, which is being adapted for the London newspapers, the suburbans, and cinema filmlets. Sixteen-sheet posters will be seen on nearly 1,000 sites in the board's area.

Visit to Birkshall Gasworks

J. Hargreaves, President of the Yorkshire Junior Gas Association, points out the new purifiers to the immediate past-President, A. Wilkinson.

MEMBERS of the Yorkshire Junior Gas Association turned out in force on March 15, for 'President's Day' at Bradford. The forenoon was taken up with a visit to the Birkshall works of the Bradford undertaking of the North Eastern Gas Board, where members gathered at 10.30 and were later escorted round the works. The vast extensions in progress at Birkshall at the present time made the Juniors' visit all the more interesting and instructive, as they were able to see new plant in varying stages of completion, from the foundations of the new vertical retorts to work in progress on a two-lift column-guided gasholder which is in process of being converted to a four-lift spiral-guided holder.

After touring the works, members were the guests of the Bradford undertaking at a luncheon held in the Co-operative Restaurant.

Mr. **J. Hargreaves** (President), addressing the gathering after lunch, said how pleased he was to see such a good attendance of members. 'In the past,' said Mr. Hargreaves, 'it was usual for the president to take members round his own undertaking on President's Day. However, as I am now stationed at the board's headquarters, I do not have an undertaking, so I had no alternative but to borrow my old one, that being Bradford.'

Mr. **C. A. Newham** (Group General Manager, Bradford) said he was delighted to have the pleasure of extending a welcome to the President and to all members of the Yorkshire Junior Gas Association, with their guests and friends. He was particularly pleased to see Mr. R. J. Bradshaw, President of the Manchester District Junior Association of Gas Engineers.

Mr. **Hargreaves** thanked Mr. Newham for his welcome, and said how pleased they were to see Hon. Members with them, including Mr. B. F. Browne, Mr. Carlton, Mr. Webb, and also Mr. Firth, who was shortly to retire from the Leeds undertaking. Mr. Firth had been a member of the Association since 1904, and they would like to take the opportunity of extending to him all good wishes in his retirement. Mr. Hargreaves added they were always very pleased to see Mr. Currier at their meetings.

Mr. **G. E. Currier,** O.B.E. (Deputy-Chairman, North Eastern Gas Board), said that he always liked to be present at Junior meetings. He was sorry that Mr. Sutcliffe had been unable to be present, but he was pleased to see a number of old friends and Hon. Members. Mr. Browne had been made O.C. Gas Engineers' Guild, Yorkshire, and they wished him every success. He was also pleased to see a representative from the North Western Gas Board in Mr. Bradshaw, President of the Manchester Juniors; and he added that the North Eastern Gas Board was indebted to the North Western Gas Board for giving them an excellent man as assistant to the Chief Engineer, in Mr. F. Charnley. In regard to the new works at Birkshall, this was not the work of one person alone; it was the result of team-work. He would add, however, that full marks must be given to Mr. Johnstone and Mr. Hargreaves and to all who had assisted. Birkshall would be the largest manufacturing station in the area, with an output of 20 mill. cu.ft. per day. Mr. Currier expressed the hope that the Yorkshire Juniors would see fit to have a closer link with the Institution.

Thereafter **Mr. Hargreaves** gave his Presidential Address. This will be published subsequently.

Mr. C. A. Newham, Group General Manager, Bradford Group, showing visitors round Birkshall Works. From left to right: G. E. Banks, Secretary, Yorkshire Junior Gas Association, F. Firth (Leeds), J. W. Wood, C. A. Newham, S. Davies, Senior Vice-President, Yorkshire Junior Gas Association, and H. Dearnley, Junior Vice-President.

The Spring Meeting of the Eastern Association of Gas Engineers and Managers will be held at Felixstowe on Thursday and Friday, May 4 and 5, and will be opened by a reception on the Thursday evening at the Felix Hotel, guests being received by Sir John and Lady Stephenson, and the President and Mrs. C. E. Grimwood. The business meeting will be held on the Friday morning, followed by the Association's luncheon and a visit in the afternoon. The golf competition will be held on the Thursday afternoon over the Purdis Heath Golf Course, Ipswich.

The Institution of Electrical Engineers has conveyed to the Institution of Gas Engineers a cordial invitation to its members to attend a discussion on 'Temperature Measurement,' to be opened by Mr. J. A. Hall, B.SC., and Mr. C. R. Barber, B.SC., at the Institution of Electrical Engineers, Savoy Place, W.C.2, on Tuesday, April 18, 1950, at 5.30 p.m. (tea at 5 p.m.). The proceedings will be informal and an abstract of the openers' introductory remarks will be obtainable about 10 days before the meeting from the Secretary of the Institution of Gas Engineers, 17, Grosvenor Crescent, S.W.1.

The 9th Annual General Meeting of the Gas Research Board will be held at Gas Industry House, on April 19, at 12 noon, to receive the annual report and the accounts; to elect officers and appoint auditors; and to transact the business of the annual meeting.

The Spring Meeting of the Southern Association of Gas Engineers and Managers will be held at the Connaught Rooms, London, on May 23, when Mr. Eric O. Rose, Divisional Engineer, and Mr. W. T. Gedge, Divisional Constructional Engineer, Tottenham Division, Eastern Gas Board, will give a paper on 'Forty Years of Reinforced Concrete with Special Reference to Recent Developments.'

Meter Testing in Wales

SIR WYNNE CEMLYN-JONES, Chairman of No. 16 Anglesey Group, complained at a meeting in Cardiff on March 24 of the Wales Gas Consultative Council that there were gas consumers all over Wales who had no idea to whom they could apply to have their meters tested. The council, over which Alderman George F. Hamer presided, discussed at length complaints throughout the area of defective meters, and Mr. **T. O. Jones,** Acting Secretary to the Council, explained that replacements in the case of defective meters were being made but at the present time the situation could not be coped with adequately. There were examiners all over England but they were not, as yet, fully covering Wales. He knew of five or six examiners who were each covering a large territory in Wales.

Call for Information

On the motion of Councillor B. Watkins (East Glamorgan), a resolution was passed calling upon the board to see that consumers were supplied with the fullest information on all points connected with the gas service together with their rights and privileges.

Mrs. **E. C. Chalke** (representing the W.V.S.) referred to the 'psychological effect' on the consumer of cash discounts which were a great aid to prompt payments, and following further discussion on this point Mrs. **H. Harry** (Caenarvon) moved that the board make whatever system of cash discounts or repayments it had in operation uniform throughout the whole of the area. Councillor **B. Watkins** pointed out that in a letter received from the board and read at a previous meeting it was made quite clear that a uniform policy of cash discounts was already in operation. He did not think a resolution necessary, and other members taking the same viewpoint, the resolution on being submitted to the vote was defeated.

Complaints were received from Brynmawr U.D.C. and Nantyglo and Blaina U.D.C. that the price which they now paid to the Pontypool undertaking was excessive. They pointed out that during the war years they were part of an emergency scheme on which the same cost prevailed and they felt that there was a strong case for reduction. Mr. **T. O. Jones** pointed out that in most of the districts there had been an increase in the price but that the Brynmawr and Nantyglo/Blaina areas being regarded as having already reached the 'ceiling' price had been subjected to no alteration. It was eventually decided to request the urban authorities in question to send a deputation to the Council while they, in turn, would arrange for a gas board official to meet the delegates.

A note on the new works at Wrexham was circulated among the members for their private information, the **Chairman** explaining that general information on this undertaking would be made available to the public very shortly.

It was reported that Miss D. G. Miskin, Swansea, had been appointed Deputy Chairman of the Council.

Gas Cooker Progress and Design was the subject of a lecture given to the members of the Cornish Gas Association at Truro, on March 1, by Mr. A. Forshaw, M.SC., Chief Chemist, R. & A. Main, Ltd. By means of the latest types of Main cookers on show, Mr. Forshaw illustrated many of the interesting points referred to in his remarks. At the invitation of Mr. J. Dean and under the auspices of Mr. A. L. Higham, M.B.E., the fittings and sales staff of the Hull group of the North Eastern Gas Board were addressed on the development of the gas cooker by Mr. Forshaw on March 8.

Commemoration Dinners

The Secretary of State for Scotland has informed Dunfermline Town Council that 11 members of the council will not be surcharged for the £108 dinner given to employees at Dunfermline gasworks to mark the transfer of the undertaking to the State. When the suggestion of a dinner was first put forward the 11 councillors voted in favour of it and carried the motion. It was stated at the time that there was no authority for such expenditure. When the council's accounts were being audited the auditors reported the expenditure to the Secretary of State, who asked the Council for an explanation.

Similar observations have been made by the Secretary of State to the Dumbarton Town Council regarding a £146 commemoration dinner and a £110 staff dinner and dance, which were held in April last year prior to nationalisation of the Dumbarton Gas Department. Expenditure incurred on these functions was the occasion of a complaint from two ratepayers at the annual audit of accounts of the Town Council, following which the auditors made an interim report to the Secretary of State. The Secretary of State determined that the expenditure for the staff dinner and dance was not contrary to law, and that the expenditure on the commemoration dinner was illegal, but being satisfied that the circumstances were such as to make it fair and reasonable that a disallowance or surcharge should not be made, abstained from making a disallowance or surcharge.

Nationalised 'New Look'

MR. T. MERVYN JONES, Chairman, Wales Gas Board, proposed the toast of the 'Trade and Industry of South Wales' at the annual dinner of the South Wales and Monmouthshire Society of Chartered Accountants, on March 24, where the principal guest was the Lord Mayor of London (Alderman Sir Frederick Rowland), supported by Sir Russell Kettle, President of the Institute of Chartered Accountants, a senior partner of Deloitte, Plender, Griffiths & Co., who have recently been appointed auditors to the South Eastern Gas Board.

Speaking of the nationalisation of the gas industry, he said their new dress was virtually identical in design—just a few differences in hemlines—with that advocated by an independent commission presided over by the Chairman of Unilevers, selected by a Minister of the Crown named Lloyd George, and appointed by a Government whose Prime Minister was called Winston Churchill, none of which eminent gentlemen was conspicuous for his undivided allegiance to certain political beliefs—certainly none of them normally favoured red in dress design. 'But nothing could be more dull and possibly more dangerous than to compel all ladies to wear the same dress, or any other industries to wear our dress,' Mr. Jones continued, 'but dare we hope that here in South Wales trade and industry, like the mature males they really are, will look not to the dress but to what is underneath, before making their final judgments on these great fellow industries—for such indeed we are. The fortunes of coal, electricity, transport, water, and gas are inextricably mixed up with those of trade and industry generally and the stability and prosperity of each is essentially that of all.' In South Wales they might fairly claim that these services were now good and were rapidly getting better. Particularly was this so when they thought of the three new major power stations now being constructed at Uskmouth, Llynvi Valley, and Burry Port and the water development schemes, especially in the Swansea area, their ample railway and dock facilities, the western gas grid based on Port Talbot already partly in operation and the eastern grid for East Glamorgan and West Monmouthshire shortly to be constructed.

Sir **Russell Kettle,** responding to the toast of the 'Society of Chartered Accountants,' referred to the annual reports and accounts running to 300 and 500 pages and costing 5s. to 7s. published by the nationalised industries. 'It seems desirable,' he said, 'that something in the form of abbreviated and simplified reports and accounts should in future be made available for the general public at a nominal charge!' Unless this was done it would continue to be impossible for the layman reading these volumes to 'distinguish the wood from the trees.' Some concern was being felt as to whether there existed for nationalised industries some effective means for the protection of the public, such as were possessed by shareholders in public companies. He suggested some machinery to provide means of keeping the policy and actions of the national boards under continuous and critical review. Unless there was something like that the public would never get a proper measure of how nationalised boards were going on.

'Gas Service' Competition

Judges Select Best Sales Papers of the Year

Results are now available of a competition perhaps unique in the history of the gas industry—a competition for the best sales paper, sponsored by a technical journal. The competition, which was promoted by our sister journal, *Gas Service*, was intended to create an incentive for the gas salesman and in particular the younger man or the man who has hitherto hidden his light under a bushel. It will be remembered that, in pre-war days the award of the Goodenough gold medal and Area silver medals formed a popular feature of the annual meetings of salesmen in London. These awards were discontinued some years ago, and it was in the hope of providing a temporary substitute that *Gas Service* decided to arrange its own competition, with the co-operation of the then British Gas Council.

The response was remarkable, the vast majority of Salesmen's Circles submitting papers. A total of 27 was received and these were judged by a panel consisting of Mr. R. J. Gregg (representing the Gas Council), the Editor of *Gas Service*, and the Editor of the *Journal*. Prizes, which, it is hoped, will be presented in London on March 31, consist of books to the value of ten guineas (first prize), five guineas (second prize), and three guineas (two equal third prizes).

The winner is J. B. Maylam, D.F.C., Tottenham District Manager of the Eastern Gas Board, whose paper 'Selling Gas Cookers,' originally presented to the Eastern Gas Board (Tottenham Division) circle, is reproduced below. Second prize is awarded to C. G. Osborne, New Housing Representative, North Thames Gas Board, for his paper 'Gas and the Small Post-war Home.' The two equal third prizes are awarded to Miss P. D. Knight, Home Service Adviser at Wakefield, North Eastern Gas Board, for her paper 'What is Home Service?,' and to W. E. Laird, Showroom Manager at Canterbury, South Eastern Gas Board.

Selling Gas Cookers

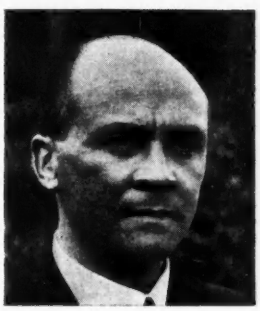
By J. B. MAYLAM, D.F.C., Assoc.M.Inst.Gas E.

THE Tottenham District office of the Eastern Gas Board recorded the highest cooker sales during the campaign which ended so successfully on September 19, 1949. I would like to make it clear that I had little to do with this achievement. The plans had been laid by my predecessor and the sales had been made by the effort and team-work of the staff at that office.

Before selling cookers in large numbers we should examine the facts and be satisfied that a cooker campaign is justified from both the national and the gas industry's point of view. The Government has done everything possible to cut down the goods available for the home market. Why, then, has a comparative free hand been given to the many cooker manufacturers, particularly in view of the acute shortage of steel, to produce the large number of post-war cookers available at the present time? Further, why has the purchase-tax been removed?

I think the Government is beginning to realise that only by using smokeless fuels in modern appliances of high thermal efficiency will fuel conservation be achieved. It is admitted that one would not gather the same impression from the prohibitive purchase-tax on water heaters. The Government also realises that a modern cooker is a labour saving appliance, that it is not a luxury, and that it is indirectly an aid to increased production in the export drive, either from a housewife working part-time in a factory or office, or from a husband whose wife creates an atmosphere of well-being because she has the advantage of using a labour saving cooker.

The cooking load is a vital one to the gas industry; it is our bread and butter load. It has been estimated that one-half



of all town gas used in the United Kingdom is used on the domestic gas cooker. This percentage is a little higher in the Tottenham Division where an average of 80 therms is used annually by each domestic consumer out of a total of 130 therms—that is, 61.5%. It is estimated that 86.4% of consumers in our Division cook by gas.

The chief competitor in the field of domestic cooking is the electric cooker, and there is no doubt that it presents a very real threat to our basic load. I compare the merits and demerits of modern gas and electric cookers:—

Although gas cookers have been streamlined in recent years, the modernity appeal is still in favour of the electric cooker, which is an easier appliance to keep clean, particularly in regard to the hotplate. A survey made by the former Gas Light and Coke Company some two years ago showed that of those consumers who had changed from gas to electric cookers approximately 90% had done so because the gas cooker was considerably more difficult to keep clean. Some of these people were basing their comparison on an obsolete black gas cooker, but even a modern gas cooker suffers by comparison. The manufacturers have gone part of the way in minimising crevices that trap dirt, and during the last two years we have seen the introduction of the easy-clean one piece oven box construction. Much improvement has yet to be made in this direction if we are to avoid further losses to the electrical industry.

The walls surrounding an electric cooker are usually cleaner than those surrounding a gas cooker, particularly in the vicinity of the oven flue outlet, and in indifferently ventilated and low-ceilinged kitchens ceiling discoloration is much more severe with a gas cooker owing to the high temperatures of the convection currents.

Running costs favour cooking by electricity at ½d. a unit unless gas is supplied at 1s. 3d. per therm, which is not the case in the area of the Tottenham Division unless two-part tariff is being enjoyed by the customer. These figures are based upon the generally accepted assumption that 20 units of electricity are equivalent to 1 therm of gas when used for cooking. This relationship assumes that all waste heat stored in the hotplate is used in the cooking operation—a condition which rarely applies to the busy housewife—and also assumes the use of ground based hotplate utensils. A recent survey made by the former Northmet Electricity Supply Company showed that only 28% of electric cookers were so equipped.

In practice, therefore, there is only a slight advantage in favour of the electric cooker in running cost. The usual standing charge on the electricity supply has

not been included in the comparative cost as the use of electricity for lighting and power makes an electrical two-part tariff attractive without the use of an electric cooker.

Of the advantages of the modern gas cooker we are well aware. In brief, it is noticeably faster in operation, which is a most attractive feature, particularly to those who return from work to cook their own meals. The heat control is much more flexible, and it is a much simpler appliance to use.

The purchaser of a new cooker, unless she has been misled to believe that electricity is *the* modern fuel, or unless she is conservative and disinclined to try out electricity having used gas for years, has to decide whether she prefers an appliance which is exceptionally easy to keep clean and one which leads to cleaner conditions in the kitchen, to a gas cooker which is fast and much easier to manipulate.

It will be seen that we have a very strong competitor in the field of domestic cookers and one which has not as yet made a real sales effort. This lack of effort has been partly due to the non-availability of electric cooking appliances and partly to the electrical industry's difficulty in holding the cooker load. Both these difficulties are likely to be overcome in the near future, and we can be sure that from 1951 onwards there will be a big effort to obtain a better share of the cooker load.

With this prospect in mind and with 36,000 black cookers on the district, we of the Tottenham Division must do everything in our power to install as many modern gas cookers as possible in order to render ineffective the electrical effort when it is made.

The Need to Sell Now

When planning a cooker campaign the following points should be considered: All employees should be 'put in the picture' and given the reasons for launching the campaign. This is best achieved by calling both sales and manual staff together and putting it over in a big way. A reasonable target should be set, preferably on an office basis, and a target date so that the staff can realise an end to their efforts.

The timing of the start of the campaign is very important, and to raise the moral of the sales staff it is desirable that there should be an immediate increase in cooker sales during the first week of the campaign. Spring and autumn are the best times for the start, so as to avoid the tight money periods of Christmas and summer holidays.

The campaign should be so planned that up-to-date results of sales are published at short intervals and made competitive between offices, and at district offices competitive between district representatives.

There should be an adequate selling staff to handle enquiries for new cookers brought about by publicity, and an adequate sales force to go out for new business by district canvass.

There should be adequate cooker installation staff so that a prompt fixing service may be offered as one of the inducements when selling a cooker.

There should be an intensive local publicity campaign, preferably backed by a national campaign. There must be an adequate stock of cookers in a variety of finish, design, and price. Commission should be paid for sales achieved.

It is important to create the impression that a unique opportunity is being presented to the public for purchasing a gas cooker. We in the gas industry are far too conventional in display, and it is not sufficient to place a range of cooking appliances in the showroom window and hope for the best. Our window displays and paper advertisements should be such as to arrest attention and to be novel in presentation.

Publicity

Insufficient use is made of the outside of showroom windows and we should not be afraid to use flags, streamers, posters, &c., to attract attention to a particular display within.

The use of a sales target window display similar to that used in saving campaigns showing how many modern gas cookers were being purchased by other customers on the area might put the right idea in the heads of passers by.

In the showrooms there should be an abundance of cookers available for view, so arranged that the selection of an appliance is made as easy as possible by a customer. As the customer's choice of an appliance is governed chiefly by his/her pocket the appliances should be displayed in price groupings. A price tag should be prominently displayed in units understood by the customer so that she/he should have no need to ask the price.

It is not sufficient in a cooker campaign to rely on publicity to create sales. On every call made by a district representative, no matter the main reason for the visit, he should check the condition of the gas cooker and, if it is of obsolete pattern, endeavour to make a sale. Further opportunity is presented when the hire purchase of some other appliance is complete and the contract is returned by the representative. Complaints of excessive gas consumption should always be followed by an examination of the existing cooker.

In addition to this routine effort it is necessary to campaign against the weakest spot in our armour, the black cooker, and to see to it that every user of a black cooker is canvassed. Approximately 16% of our customers in the Tottenham Division use a black cooker.

It is not sufficient to expect district representatives to canvass for new business when time and circumstances permit. It is necessary to organise district canvass and see that a certain amount of canvass work is done daily, that the results of canvass are carefully checked, and that the canvass call is given equal priority to other district calls.

In the system used at Tottenham for carrying out organised canvass, five calls, located close together, are made daily by each district representative on customers using black cookers. His visit is preceded by a letter explaining the reason for the call. The result of each canvass call is entered in a day book which is checked and analysed weekly. The results of canvass calls are summarised weekly and distributed to the staff.

This effort by district representatives is supplemented by that of a selected showroom assistant who carries out canvassing on the district each morning for approximately three hours, weekdays only. The pressure of work in the showrooms during the afternoon will not enable any of the staff to be spared. This special canvasser operates on each district in turn for periods of 14 days.

This arrangement gives the showroom staff an opportunity of showing their ability as salesmen, and this brief airing acts as a tonic to their sales effort. Further, the competitive spirit is created between the district representative and this canvasser, for neither wishes his own effort to compare unfavourably.

A further method of obtaining new business when pressure of work or sickness has prevented representatives making canvass calls has been to write the customer inviting her to the showroom to view the range of modern gas appliances. The wording of this letter is very important, as has been found by experience.

Two types of letters were sent—Type A produced negative results, Type B sold 9.4 cookers for every 100 letters despatched.

Letter A.

It is the wish of the Eastern Gas Board that you should enjoy the best service available from the use of gas apparatus.

It is now possible to offer you special facilities for the purchase by cash or hire purchase of a wide range of modern gas appliances for cooking, space heating, and water heating, which are immediately available.

The showroom staff will be very glad to show you these modern gas appliances or alternatively I shall be pleased to arrange for a service representative to visit you to discuss any alterations or additions to your gas installation that you may require.

Letter B.

I notice from the records that you are at present using one of the black free cookers, and I would like you to know that it is now possible to install a new mottled enamelled cooker on hire purchase on terms ranging from 1s. per week.

The new mottled enamelled cookers have considerable advantages over your present type and I would like you to visit the Tottenham showroom to view the very large selection.

You would be under no obligation to purchase and, should you select a cooker, delivery and fixing will be completed within a few days while present stocks last.

If you would like me to call and discuss any further details, please return the enclosed card.

Results

The results from all types of canvass effort are summarised as follows:

During a three-month period, 2,400 letters were dispatched to one-third of the total black cooker consumers on the Tottenham district.

District representatives sold 105 cookers, the special showroom assistant canvasser 64, and the canvass letters 49, total 218. Total sales value, £6,832.

Canvass sales were 32.4% of total cooker sales during the three-month period.

District representatives sold 6.4 cookers by canvass in every 100 customers interviewed. The special canvasser sold 18.5 cookers for every 100 calls. Cookers sold per week on canvass calls pre-commission, 9; cookers sold per week on canvass calls post commission, 19—an increase of 120%.

It is estimated that had only specialist

canvassers been employed there would have been an increase of 29% in cooker sales at Tottenham during the three-month period under review. It is hoped that as selling experience is gained and the payment of commission takes effect even better results will be obtained by district representatives. It would appear, however, that by employing district representatives on canvassing black cooker users we are leaving prospects to an expert canvasser for electric cookers. Such would not be the case were we to use only expert canvassers now.

Since this analysis was made a further experiment in district canvass has commenced by employing a district representative on his own district on whole time canvassing and operating *without* an introductory letter. It was considered by some that by sending a letter in advance the customer had frequently already persuaded herself against the purchase of a cooker before the canvasser had been able to employ his sales routine. This opinion was held by the district representative selected. Limited experience of this method has so far been gained but the results to date show that from 54 canvassing hours, 17 cookers were sold and the percentage of cookers sold on calls made was 11.4%. These results compare favourably with the special showroom canvasser, as insufficient time has elapsed for some of the sales to materialise. It would appear that provided a capable canvasser is used it makes very little difference whether or not his visit is preceded by a letter. Some district representatives feel that their prestige is maintained if these calls are pre-notified and if this inspires confidence the overheads on letter sending are justified.

It is not sufficient to endeavour to maintain our 85/15 advantage over the electric cooker. We must attempt to extend it by canvassing those users of electric cookers. For the first time the comparison will, in a number of cases, be between an obsolete electric cooker and a modern gas appliance. The pre-war arrangement of offering on free loan gas hotplates for use with the electric cooker should be renewed.

Following-Up Prospects

The effect of publicity and canvass effort is wasted unless organised follow-up of prospects is made.

This applies particularly to any customer who has taken the trouble to visit a showroom to see what cookers are available. If she should leave the showroom without purchasing a cooker or stating her intention of not so doing she is a Class A prospect and should be visited at her house within a few days. An analysis of follow-up calls made within four weeks of the customer's call in the showroom showed that 42% still remained prospects. I am satisfied that this follow-up call kept the prospect of a sale alive, and it is anticipated that a fair percentage of sales will eventually result from these calls.

It is important to see that when a would be cooker purchaser comes to the showroom a sale is not lost by indifferent treatment of the customer. Saturday afternoon is no doubt the busiest time in the whole week and it is a special problem because the available sales force is limited during that period, district representatives not being available to supplement the effort of showroom assistants. It may well be that a customer will leave the showroom due to lack of prompt attention to her enquiry; and it is suggested that relief may be obtained by transferring showroom staff from less busy showrooms to the busier ones, or alternatively that separate service and sales counters should be provided and arrangements made for clerks to handle the service enquiries.

Commission

A sales force operating without incentive in the form of commission for sales achieved lacks vigour and fails to produce optimum results. It is a very difficult task to plan a commission scheme which will satisfy every member of the sales organisation, but it is considered that there should be certain basic requirements of a good commission scheme as follows :—

(1) Substantial commission should be paid individually to those employees going out for new business.

(2) Pooled commission should be paid to those members of the sales staff who have the business come to them. The pooling of commission in the showroom promotes good team work and ensures equal attention to both sales and service enquiries.

(3) Friction between district representatives and showroom assistants should be avoided by making each benefit for each cooker sold, whether the sale be completed in the showroom or on the district. The sales effort by district representatives should be complementary to the effort of the showroom staff and customers must not be dissuaded against inspecting in the showroom the appliance they intend to purchase.

(4) Commission should be available to all grades of employee so as to increase the number of potential canvassers. This applies particularly to auto-collectors, meter readers, and the fitting staff, the majority of whom enjoy the confidence of the public either by reason of periodic visits or as the result of an installation job well done.

The present commission scheme operating on this Division of paying 2s. 6d. to the prospector of a sale, and 2s. 6d. each to the showroom pool and district representative concerned satisfies the basic requirements, with the major exception that it fails to reward the prospector adequately. This is worth at least 5s. for each cooker sold.

With customers of a low income group, an easy payment plan to facilitate the saving of the first and subsequent instalments on a cooker is yet another method of promoting sales, the customer being presented with a savings card and then being required to purchase weekly or at convenient periods token stamps equivalent to the weekly hire purchase repayment of the appliance. After the collection of 13 stamps of the requisite denomination the quarterly repayment is available.

It is significant, however, that during July, August, and September of this year only 30 savings cards were originated during a period which yielded a sale of approximately 800 cookers—or only 3.75% of consumers took advantage of the scheme—a poor return for a scheme operating with fairly high overheads.

Customers in the low income groups are in the habit of saving weekly whether it be for clothes, holidays, rent, or for a gas cooker repayment. Perhaps it is only this group which can envisage a balanced budget! If this is so, a weekly repayment scheme is an unnecessary facility. I prefer to think that the easy payment plan is a good one, but is not being sufficiently exploited; and I consider that repayment cards and stamps should be carried by all canvassers and offered to those customers who are anxious to buy but must delay the purchase until the first payment has been collected. A customer who has expended 2s. 6d. on the purchase of the first stamp is more likely to save the first payment on an appliance than the customer who announces her intention of calling in the showroom in the future to obtain a savings card.

New Buildings

As a departure from the wartime arrangement of the local authority allocating an equal percentage of gas and electric cookers in new buildings, freedom of choice by the incoming tenant is now an established practice in a number of London boroughs. Assuming that similar notice is given to both gas and electrical authorities it is necessary to turn an adequate sales force promptly upon the incoming tenants, preferably at their previous addresses. The exhibition of cooking and other equipment on site by arrangement with the local authority is also an advantage.

I referred earlier to the fact that a requisite of any campaign was to ensure that there was an adequate stock of cookers in a variety of colour, design, and size. Nothing is more likely to reduce the sales effort than to find that one of the short lines becomes out of stock after a few days. The Tottenham Division stock too many types of cooker, numbering 36. This variety is inclined to prove an embarrassment to salesman and purchaser alike, quite apart from the headache of stocking replacement parts in later years and the difficulty in training fitters to install and service appliances with which they are unfamiliar.

Under nationalisation an opportunity is presented to standardise on, say, half-a-dozen different domestic gas cookers and for these to be made by the cooker manufacturers operating at the present time to the exclusion of all other types. A number of research centres should be set up to study cooker design and to produce a new range of cookers, say, over a five-year period. This arrangement would no doubt appal many of the present manufacturers of cookers, but would be in line with the recommendations of the committee that recently visited America.

With our present cooker campaign there is a major need for a utilitarian type of four boiling-burner cooker of cast iron construction in vitreous enamel finish, including vitreous enamel hotplate burners and bars, and with a thermostat—the cookers to be available for 1s. per week.

The only cooker at present available for 1s. per week in the Tottenham Division is one without a thermostat and one which is fitted with only two boiling burners one of which is low rated. The wisdom of selling this appliance is open to challenge as it is considered to be a cooker insufficiently good to resist the electrical challenge when it is made.

A New Radiation Gas Appliance

THE mounting costs of all fuels, coupled with official urges to economy in using them, have emphasised the need for increasing the overall heat output from domestic heating appliances. One means of doing this is to increase the effective convection from an appliance primarily designed to yield radiant heat.

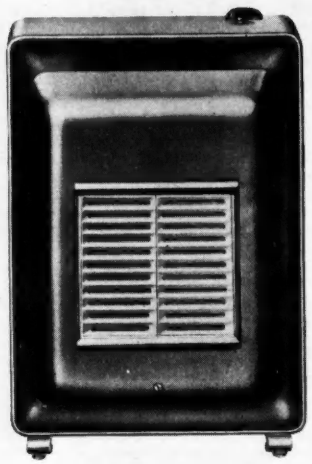
Comfort also must not be forgotten. Precise specification of the warmth conditions producing comfort is not simple, but it has been broadly established that an air temperature of at least 45°F. is necessary, with 'topping up' by radiant sources. Excessively high air temperatures are likely to lead to discomfort and should be avoided in consequence. A source emitting both radiant and convected heat should provide the greatest comfort.

Partly on account of tradition, partly from recognition that the hearth is a focal point in the room, and partly because of the practical utility of the associated chimney flue, the fireplace remains the site for the heat source whatever fuel is used. The difficulty of ensuring good visibility of the fire from all round the hearth, and the tendency of the usual fireplace to be a draught-maker have led to suggestions that auxiliary heaters should be fitted in the outlying parts of rooms to provide a background of warm air. This, while unobjectionable in principle, generally requires for its practical application the fitting of a second heater or some other special provision of a like nature.

There is much attraction about producing the warm air from the same appliance that generates radiant heat, but because this appliance would be situated at the foot of the chimney several problems are introduced which must be solved before effective use can be made of the proposal. Firstly, there must be means of generating enough warm air and of conveying it to the room; secondly, adverse effects of excessive air flow in the chimney must be countered; and thirdly, staining of the surround by the heated air must be avoided.

The solution adopted by Radiation Ltd., in the 'Vecta Beam' fire is to suspend the fire in a central frame and to direct air to the rear of the fire where it is heated by a special heat exchanger. If the design is properly carried out there is little change in the radiant heat output but the convected heat output is appreciably increased. Having produced the warm air, one must needs direct it effectively into the room. This is the function of a curved outer surround which, while giving free passage to the warmed air, directs it well clear of the fire opening.

Means are provided for ensuring that excessive chimney flows shall not diminish the warm air produced by the 'Vecta Beam' fire. The fire surround is sealed against flue suction and precautions are taken, firstly, to see that the warm air is delivered to the room away from the sphere of influence of the chimney, and, secondly, to arrange that the effects of excessive chimney flow or gusty wind conditions are neutralised. The first is taken care of by the shape of the outer shell of the Vecta Beam fire and by providing special lugs to enable the shell to be secured to the surround to obviate adventitious leaks; to meet the second a chimney break box (G.B. Pat. No. 575,121) has been devised. This consists essentially of a double channel of special shape to lead air from the



The 'Vecta Beam' Fire

base of the fire at hearth level to a flue nozzle. The fire flue nozzle itself leads into the top of this box opposite the nozzle and carries a horizontal vane to assist discharge of the flue gases from the fire proper. Excessive chimney pull or gusty conditions due to high wind are communicated to the box nozzle. The double channel in the box is so proportioned that any extra air flows are satisfied by air being drawn preferentially from hearth level instead of through the fire flue nozzle. There is thus no tendency either for the Rado-panel tops to be chilled (so avoiding loss in radiant efficiency) or for the warm air delivered from the convector to be drawn into the flue.

Staining of walls, &c., by warm air can be avoided by diluting and dispersing the air stream so that its temperature is not high and concentrated flow at any one point is prevented. It is the function of the design of the 'Vecta Beam' fire outer frame to achieve this.

The 'Vecta Beam' fire combines two parts. The central radiating portion consists essentially of a two-panel 'Silent Beam' fire. This central body is suspended in the outer shell and air is allowed free access to the space between the outer shell and the back of the fire. A ribbed convector plate is fitted at the back of the fire to facilitate production of warm air. This air passes also around the flue nozzle with maximum freedom of flow before being directed forwards and upwards away from the fire itself into the room.

The fire is rated at 16,000 B.Th.U./hr. The control tap is part of a special governor/tap/igniter fitting operated by a tap handle situated at the top right hand corner of the fire frame. A flint ignition unit is incorporated in the tap. The tap includes positively-indicated turn-down positions to provide approximately 4/5ths and 3/5ths of full-on gas supply. The arrangement of the lighting pilots is such that they are alight only when the fire itself is being lighted; they are extinguished as soon as lighting has been effected.

Both the outer and inner fronts are finished in colour. The inner front is secured by one screw only; when this screw and the lower reflector scroll are removed the front may be lifted away to disclose all working parts.

Acrylic Number Wheels and Pinions

DURING the last few years considerable thought has been given to the choice of materials employed in the manufacture of number wheels and pinions as used in direct reading clockworks for gas, water, and electricity meters, and as a result consideration has been given both to the use of acrylic plastic and also polystyrene as alternatives to tin alloy. Although this metal possesses many excellent properties, including a reasonably low coefficient of friction and good stability under varying climatic conditions, it is relatively expensive. Prior to the 1939-45 war some Continental manufacturers made use of polystyrene for the moulding of number wheels and pinions, but this was not entirely successful. Although possessing a lower specific gravity than tin alloy, together with a very low coefficient of friction, good resistance to moisture and availability in a wide range of colours, polystyrene was not able to withstand service conditions entailing exposure to temperatures much in excess of 150° F. (65° C.). Moreover, it is subject to solvent attack by petrol.

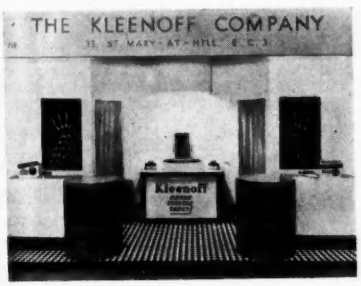
H. J. Thormann Engineering Co., Ltd., Boreham Wood, Herts, are well-known manufacturers of number wheels and pinions for the meter trade and they have carried out a good deal of research work on the use of new materials. Throughout recent years this company have conducted a continuous research with a view to discovering material for the manufacture of number wheels and pinions which should combine the advantages associated with tin and polystyrene while avoiding the disadvantages of both. In collaboration with the Imperial Chemical Industries, Ltd., Plastics Division, they have recently developed a range of meter wheels and pinions moulded from acrylic resin. This offers certain practical advantages over polystyrene owing to its extra strength, high softening point, very low coefficient of friction, and outstanding resistance to commercial petrol and a number of chemicals.

Unfortunately a wide gap lay between

the decision as to which type of material to employ and the mastery of the various processes such as moulding, machining and finishing the wheels and pinions in this new material. On top of all this a specially designed injection moulding machine had to be built in their factory, as such machines as were available in this country appeared unsuitable. At every corner new difficulties presented themselves. The able assistance and guidance freely given by the engineers of the Plastics Division of the Imperial Chemical Industries, Ltd., was invaluable throughout these trials.

Using acrylic moulding material, H. J. Thormann Engineering Co., Ltd., are now able to produce wheels and pinions which comply with all the exacting requirements of meter manufacturers and users. It is claimed that these parts, which are manufactured by injection moulding using acrylic resin, not only possess good mechanical and electrical properties but do not vary in dimensions. As the shrinkage variation of certain acrylic resins in the mould is only one-third of that of polystyrene it is possible to exercise a far greater control over the dimensions of the finished product than when working with polystyrene, cellulose acetate, and other plastics.

At Olympia



The Kleenoff stand at the Ideal Home Exhibition. The colour scheme is black and yellow on a cream background. The two large tins are true replicas of the well-known Kleenoff tin. In the background is an automatic turntable on which is displayed a cooker plate partly cleaned showing a 'before and after treatment' effect. This is strongly spotlighted and conveys the efficiency of Kleenoff to the uninitiated. The Kleenoff brush is again on display. The stand is in keeping with the modern marketing methods adopted by the Company.

Creosote Pitch as Fuel

In reply to a question from Mr. E. H. Keeling (M.P. for Twickenham), the Minister of Works, Mr. R. R. Stokes, announced in the House of Commons on March 13 that the new Government building in Whitehall will be installed with a central plant for heating all Government offices in Whitehall smokelessly. The buildings will be linked to the system by stages, and the fuel to be used will be creosote pitch, which is home-produced and smokeless.

New Trade Publications

Whessoe, Ltd., have recently published a list of the number of W.W-D. electro-detarrers installed in this country and overseas. The leaflet, which is available from Whessoe, Ltd., Technical Department, Darlington, or from 25, Victoria Street, London, S.W.1, gives details of the location of over 220 installations, their size, and the type of gas treated.

New loose leaf catalogues have been published by **Selas Gas and Engineering Co., Ltd.,** Selas Works, City Road, Manchester, 15. These cover a variety of gas-fired and gas-operated products, including surface combustion burners; soldering iron stoves and soldering irons; neat gas controlled radiant diffusion flame burners; gunmetal and cast iron quadrant type gas burner control cocks; combined gas-and-air mixing and air compressing plants; and adjustable port air-gas proportioning and flow control valves.

The **British Welding Research Association** have produced a 'spot welding of mild steel' slide rule, comprising a glossy card on which is shown two electrodes on either side of the material to be welded; around this small holes have been cut in the card to reveal the measurements, carried on the slide beneath, of material thickness, tip diameter, minimum electrode pressure, minimum edge distance, material thickness, weld time, and weld current. The whole is excellently printed and in a handy pocket size, available from the Association at 29, Park Crescent, London, W.1, price 1s. 6d., post free.

Simon-Carves, Ltd., 6, Stratton Street, London, W.1, describe in an attractive and well-illustrated booklet their range of contact and sulphuric acid plants. The brochure is divided into six sections, covering the Monsanto vanadium catalyst, Monsanto plant design, hot gas purification plants, cold gas purification plants, plant control, and process costs, together with an appendix of technical data. Each section is illustrated by photographs of the plant under discussion, and the two sections on cold and hot gas purification each contain a flow diagram. Processes are lucidly described in some detail, and the technical appendix is both useful and well presented.

A leaflet published by **Chaseside Engineering Co., Ltd.,** Station Works, Hertford, announces that all Chaseside machines within the range of shovels, excavators, diggers, one and two-ton cranes, and buffer tractors will be fitted with scoop mechanism control levers placed inside, instead of outside, the driver's cab (with the exception of the buffer tractor which needs none), and that all machines with petrol or paraffin engines will be fitted with an electric self-starter as standard equipment. The self-starter, it is claimed, in addition to easier and quicker starting, will overcome the operator's reluctance to switch off the engine in periods of inactivity with a consequent saving in fuel bills. Scoop controls inside the cab obviate any possibility of accidental activation of the mechanism, and, being in a vertical plane, make for easier work.

James A. Jobling and Co., Ltd., Wear Glass Works, Sunderland, have issued a new catalogue on their 'Pyrex' brand glass pipelines. The various component units of the pipelines are illustrated and fully dimensioned, and the physical data provided is sufficient for designing chemical and food plants in glass. The items are fully priced, all sizes of units now in production up to 4 in. bore being shown. It is understood that the larger sizes will be the subject of a later catalogue.

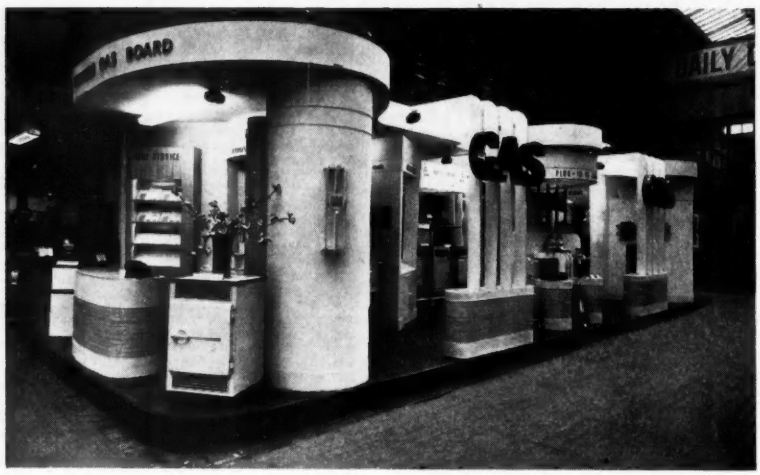
The February number of *Group Review*, the house journal of the **Simon Engineering Group,** Cheadle Heath, Stockport, maintains the high standard of photographic presentation associated with this publication. The work of the many departments of the Group which is described is impressive in its magnitude, but particular interest will be found in two sections relating to coke ovens and chemical plant. These contain brief accounts of latest installations undertaken for the gas industry and the National Coal Board, together with photographs of the plant.

Publication No. 36, produced by **Electromagnets, Ltd.,** Boxmag Works, Bond Street, Hockley, Birmingham, 19, gives details, specifications, and technical data of the company's range of circular and rectangular suspension magnets. The former type of magnet has been designed to give a considerable depth of field to deal with material lying deep on the conveyor belt; the latter can be used where material is thinly laid. Neither gear is self-discharging, but arrangements can be made for the magnet to be swung clear of the conveyor belt for cleaning off tramp iron. The equipment is particularly suitable for use where it is not desired to install continuous discharge type equipment, due to the relatively small percentage of tramp iron to be removed.

Birlec, Ltd., Tyburn Road, Erdington, Birmingham, 24, have published a leaflet, 'Shaker Hearth Conveyor Furnaces,' which describes a new approach to the continuous heat treatment of small steel components. The essential feature of the process outlined is a shaker-hearth, the furnace of which is electrically heated with a special endothermic gas atmosphere obtained from town gas to ensure a bright finish without decarburisation with carbon steel components. The conveyor system is adaptable to both hardening and tempering operations. Birlec, Ltd., have also issued two reprints in leaflet and booklet form—'Carbon Steels—New Atmosphere for Decarburisation-Free Treatment,' by P. F. Hancock, and 'Annealing of Whiteheart Malleable Castings: Some Aspects of the Gaseous Process,' by Dr. F. Schulte.

The Address of the head office of the Walsall and District Division, West Midlands Gas Board, is now Walsall Factory Estate, Tame Bridge, West Bromwich Road, Walsall. Tel: Walsall 6431-4.

Brighter Homes' Exhibition

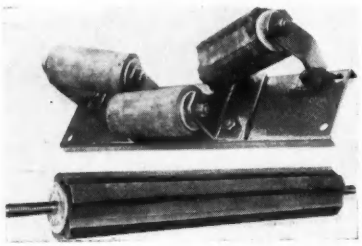


Our photograph is of the stand of the North Western Gas Board at the 'Daily Dispatch' Brighter Homes Exhibition in the City Hall, Manchester. During the first week of the exhibition the board's stand attracted 528 booked enquiries from consumers. The exhibition was opened by Wilfred Pickles on March 7 and closed on Saturday last. There were 130 exhibitors and the organisers, the Manchester 'Daily Dispatch,' were able to announce a record attendance.

Conveyor Belt Cleaner

Richard Sutcliffe, Ltd., Universal Works, Horbury, Wakefield, are now supplying a new type of belt cleaner. The rapping roller, as it is known, has been introduced to serve the dual purpose of centralising the load on top belts and removing dust or sticky materials from the return belt of conveyors. The roller consists of a heavy-duty idler roller, to which four or more ribs of specially compounded rubber are vulcanised.

As the roller revolves, the ribs tap the belt lightly; this vibrating effect causes



Above: A rubber covered idler fitted with one wing rapping roller. Below: A five ribbed rapping roller.

an oscillatory movement of the belt and centralises the load. When the roller is used with the bottom belt, it sets up the same conditions, and removes the adhering dust or sticky material. The special rubber compound used ensures that the clinging material does not stick to the roller, and its efficiency is therefore continuous and without need for attention. The tracking of the belt is not affected by the use of the rapping roller.

When the roller is used in conjunction with a dust suppression box it forms an effective and easy method of belt cleaning.

Institute of Fuel

The annual general meeting of the Institute of Fuel will be held on April 27, at the Connaught Rooms, Great Queen Street, London, at 11 a.m. It will be followed by a general meeting of members at which Dr. D. T. A. Townend will deliver his second Presidential Address.

The annual luncheon will be held on the same day at 1 p.m. at the Connaught Rooms. The principal guest and speaker will be Eng. Vice-Admiral Sir Harold Brown, G.B.E., K.C.B., who has been Chairman of the Fuel Research Board since 1947.

Publications Received

An interesting industrial brochure representing *Tees-Side Enterprise* has been published by the Tees-Side Chamber of Commerce and the Tees-Side Development Board. A covering note draws attention to the fact that the area is a district in which industrial expansion is taking place at an extremely high rate; few, if any, parts of the country, it is stated, are embarking upon such a concentrated programme of capital works. Local manufacturers and others depending on Tees-Side activities have supported the production of the brochure, which is excellently printed.

The need for a concise book on the science and practice of heat transfer has been met by the publication of *An Introduction to Heat Transfer*, by M. Fishenden and O. A. Saunders (Oxford University Press, 15s.). This book interprets the experimental results attained in the light of established physical laws and theory, and endeavours to present them in ways convenient for practical use. While the has been written primarily for the student, the simplified forms to which the data have been reduced, together with the numerous calculations showing the application of these to design problems, are of general interest.

Corrosion Problems

The perennial problem of corrosion removal and prevention is the subject of two information leaflets, which announce the availability of new products. The first, from the **Pyrene Company, Ltd.,** Great West Road, Brentford, Middlesex, describes 'Preperite,' a general purpose rust remover, which can also be used for the removal of corrosion products from aluminium and aluminium alloys. Flexible in its application, it can be used either as a brush-on material or made up for the treatment of parts by tank immersion. Advantages claimed are that the solution does not need to be discarded at regular intervals, a replenishment of 'Preperite' chemical being sufficient, and that it can be used cold or heated to any temperature up to 140°F. for accelerated removal.

The second product, 'Glopane,' is a cold galvanising, anti-corrosion coating for iron and steel surfaces, manufactured by **Clear Glass Products, Ltd.,** 16-18, Malvern Road, Southampton. Features of this method, which includes gasworks among its many industrial uses, are that it can be applied by brushing, spraying, or dipping, either in the factory or after the iron and steel work is in service, and that the surface to be treated need not be chemically clean; it can be applied straight over the rust. Quick drying, the coating does not crack or glaze, is electrically conducting, and provides an undercoat for oil-bound paints.

A New Pressure Cooker

On March 8 we were given an opportunity to examine the latest addition to the range of 'Prestige' pressure cookers manufactured by Platers & Stampers, Ltd. This is the 'Ekcomatic Hi Dome,' illustrated below, which is remarkable for

The 'Ekcomatic Hi Dome'

its unusually deep cover, permitting the accommodation of three or four 2-lb. Kilner jars. The model has a three-way pressure control, permitting pressures of 15, 10, and 5 lb.; a special attachment is available for the sterilisation of children's feeding bottles, &c. The ease of control possible with gas cooking makes this fuel particularly suitable for the pressure cooker, and the 'Ekcomatic' therefore provides yet another indirect selling point for the gas salesman.

Newport Employees' Benefit Dinner

MR. J. F. RUST, M.INST.GAS E. (General Manager and Engineer, Newport, and Chairman of the Newport Group), presided at the annual dinner at Newport when the employees' benefit was distributed. Supporting the Chairman were Mr. T. Mervyn Jones, M.A., LL.M., Chairman, Mr. R. S. Snelling, J.P., F.C.I.S., Deputy Chairman, Mr. E. M. Edwards, M.INST.MECH.E., M.INST.GAS E., Sir William Jones, C.B.E., Mr. F. E. Price, F.S.A.A., Alderman J. E. Emanuel, and Alderman G. F. Hamer, of the Wales Gas Board; Mr. A. H. Dyer, Deputy General Manager and Engineer, Mr. A. H. Cane, F.C.I.S., Secretary (Newport). Messrs. A. E. Pask, C. L. Singleton, C. E. Pritchard, and T. Wilkinson, Members of the Newport Group Committee, Col. R. H. Studholme, M.A., former Director of Severn Valley Gas Corporation, Mr. C. O. Lloyd, former Director of the Newport (Mon.) Gas Company; Messrs. D. M. Hughes, I. Williams, J. V. Drake (British Benzole and Coal Distillation, Ltd.), Messrs. W. E. Crowley, E. J. Oke, T. F. Edwards, and S. G. Meade.

Mr. **T. Mervyn Jones,** in proposing the toast of the Chairman and members of the Newport group, expressed his pleasure at having the support of all the members of the Wales Gas Board with the exception of Mr. J. C. Clay who, unfortunately, was unable to be present. He paid tribute to the efforts Mr. Rust and his committee had made to ensure the success of the undertakings which came under their control. The board had instituted the group committee scheme in order that control should remain largely with the men on the spot and, in this respect, the results in the Newport group were fully justifying the adoption of that method. The nationalised gas industry was nearing the completion of its first year's working. There had been criticism, as was the case in all the nationalised industries, but he and his colleagues on the board welcomed this criticism, realising that it would help to create a healthy and successful gas industry. They looked forward to the future of the Wales Gas Board with great confidence.

Mr. **Rust,** replying, said he and his committee had taken upon themselves heavy responsibilities in connection with the group, comprising the Newport, Monmouth, Chepstow, Caldicot, Risca, and Abercarn undertakings. They had developed a wonderful team spirit and he was pleased to learn from Mr. Mervyn Jones that they were giving reasonable satisfaction in the carrying out of their duties.

The **Chairman,** in calling upon Col. R. H. Studholme, M.A., to propose the toast of the employees of the Newport undertaking, spoke of the great efforts made by Col. Studholme during the committee stages of the Gas Bill to ensure that employees' benefits were adequately safeguarded. It was due, in no small measure, to his efforts that they were receiving such benefit that evening.

Colonel **Studholme** said nothing gave him greater pleasure than the fact that employees were receiving a bonus, and that the bonus was in keeping with that paid in previous years. In connection with his efforts to secure amendments to the Gas Act he had obtained the greatest assistance from the working results of the Newport Gas Company. He wished success to all the employees and reminded them that when the holding companies were first formed they were frowned upon, but events had proved the soundness of this policy. Similarly this could be so with the nationalised gas industry.

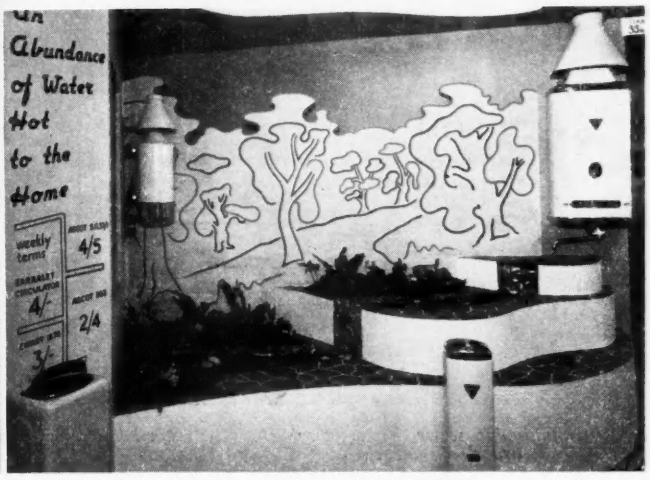
Mr. **A. H. Cane** responded on behalf of the employees and referred to the happy relations which had always existed between employers and employees at Newport. This was reflected in the length of service given to the undertaking as it was common to find employees with 30 to 40 years' service.

Mr. **A. H. Trigg,** who has recently completed 50 years' service, also spoke in reply to the toast.

Mr. **R. S. Snelling** distributed the benefit and said that during his career with the Newport undertaking he had, in his various capacities, proposed or responded to all the toasts which were customary on these occasions; now, in making the distribution, he was privileged to have fulfilled all such pleasant duties involved in these functions.

Gas to the Fore at Torbay Exhibition

Our photographs show the stand of the South Western Gas Board at the Torbay Ideal Home and Trades Exhibition, held at the beginning of this month. Designed by the Divisional Publicity Department to the requirements and specifications of the Torquay Sub-Division, the stand created interest by its unusual features. Its main features, as illustrated, were a cascade water display with scenic treatment, a kitchen display, incorporating a built-in cooker, sink unit and multipoint heater, a lounge gas fire display, and a range of self-coloured cookers.



Gas Operated Central Heating

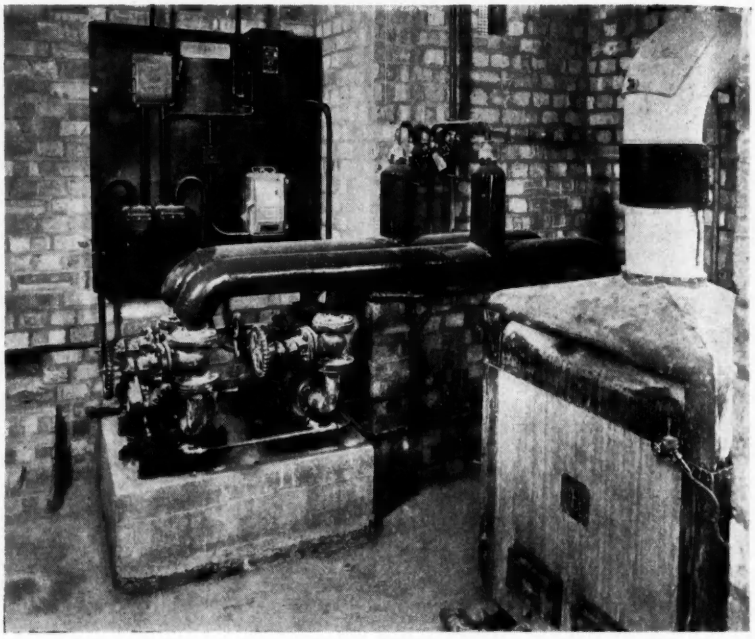
South Eastern Gas Board Overcomes Space Difficulties in a Lambeth Installation

THE provision of central heating and hot water services in buildings where a basement does not exist or where floor space is restricted has always been a problem to the heating engineer. Both of these difficulties were found to be present when the South Eastern Gas Board was asked to provide central heating and a hot water service in the Constructional Engineering Union's new building in Lambeth, S.E.1.

The architect and the appointed heating engineer were consulted and they both agreed to the gas board's suggestion that the most satisfactory solution to the problem would be to erect the boiler house on the roof.

Two small buildings were erected there —the larger to house the lift motor and mechanism and the smaller the gas-fired central heating boiler and circulating pumps. The boiler plant is fully automatic being controlled by a Venner time switch and a Satchwell temperature compensator. The circulating pumps are in duplicate and the heated water is pumped down to the heating panels fitted in each of the offices.

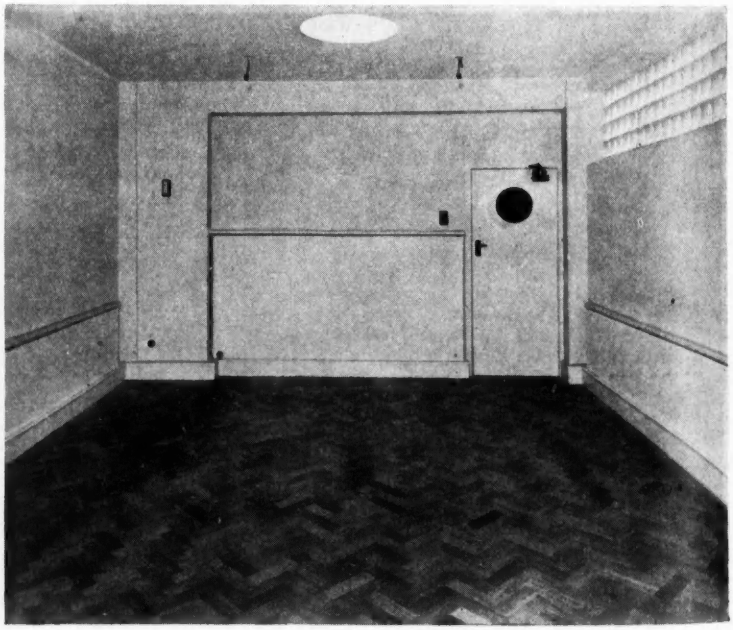
There is a cloakroom on each of the four floors to which hot water is provided by two Ascot multipoint water heaters, each multipoint serving the cloakroom in which it is fitted and the one immediately above it.



Potterton 'Rex' boiler, duplicate circulating pumps, and control panel in the boiler house on the roof.

The building was designed by Messrs. T. P. H. & E. Braddock F/A.R.I.B.A. and the heating plant installed by the Thames Bank Iron Company, Ltd.

Ascot multipoint water heater serving two cloakrooms.



Panel heaters fitted in an office typical of the installation throughout the building.

THE JUNIORS IN A NEW INDUSTRY*

By C. H. CHESTER, O.B.E., M.I.Mech.E., M.Inst.Gas E.,

Chairman, South Western Gas Board; President, Institution of Gas Engineers

ONLY if well-trained men, having a broad outlook on life as a whole, come forward in sufficient numbers to take the place of the older ones who in the nature of things must eventually lay down their labours, can our industry expand and progress as it must do. Such thoughts lead our minds logically to the basic question of education, without which our efforts would be wasted or, more deplorable still, misguided.

Your Association, during the half-century of its existence, has always been held in high esteem for its pioneering work, which is probably due to the fact that you have kept a close watch upon the twin necessities of selecting the right type of man and then training him correctly. In looking through the early transactions I noticed that, at your 15th annual meeting, held in April, 1914, the President, Mr. W. L. Heald, was able to report that the Association was increasing in strength because of 'the type of man admitted to membership.'

The Question of Status

That brings me to the first thought I would commend to you—namely, that to increase the status of the Junior Associations, their respective councils should maintain diligence in the scrutiny of new applicants for membership.

At the same annual meeting, Mr. McNicholl devoted a considerable part of his inaugural address to what he termed 'educational methods,' and said '. . . what the youths of today chiefly want is the kindly interest of those who, by reason of their ripe experience, can direct their studies into the proper channels.' While again, in October, 1927, Mr. Frank Small devoted a portion of his address to the Education Scheme.

Since that time considerable progress has been made in the educational field, and you may rest assured that the area boards will, quite apart from their obligations under the Gas Act, see to it that adequate facilities for training are made available for all grades of their staffs. They will do that not only because they had a duty to perform, particularly towards their junior personnel, but also because in industry, as in nature, everything is dynamic. Nothing stands still; in every phase we either progress or retrogress. That, of course, is the difficulty facing the type of mind which, fearful of the future and wishing to take the course of least resistance, would advocate what has been termed 'a research holiday.' But you all know that, by the very nature of life itself, such a course is not possible. Therefore, I say be courageous in your attempts to further the industry and its processes, but temper your courage with reason.

This brings me to another important point—namely, the value of considering historical development. I know that many unkind things have been said about history, and still more about historians, but I do suggest that in order to develop a balanced and progressive outlook the junior members of the industry should spend some time in becoming familiar with its history over the past century and a half, so that they may learn of the trials, struggles, and courage which have marked its course. In this way we may combat any excessive desire to rate security higher than ambition, because such an outlook retards progress.

It is well to remember that one of the important differences between the designation 'Seniors' and 'Juniors' does not of necessity arise from the possession of qualifications, particularly paper ones, but from possession of that essential qualification experience, with special reference to men, machines, and methods; and although so much is being done at the present time to bring the benefits of education within the reach of all there are, as far as I am aware, still no free scholarships to the school of experience. It is, as many have said, a hard school, but fortunately the senior members of our profession are usually ready to pass on their experience freely to those willing to accept it.

While realising that good advice is usually more easy to give than to take, and at the risk of being accused of lecturing, I would like to emphasise one or two points.

In the first place, take full advantage of the excellent opportunities afforded by the meetings of the Junior Associations for the interchange of ideas and the discussion of problems of all kinds, because, left to our own devices, most of us are apt to think highly of our own opinions, and it is a good and salutary experience to have some pet view demolished by a colleague. This broadness of outlook you endeavoured to cultivate by the inauguration of a series of University Lectures in collaboration with the Association as long ago as 1914.

The Balanced Outlook

The junior may sometimes be keen to have an idea put quickly into practice, but he should pause to balance the cost against the benefits hoped for. If he feels unable to do that, by reason of lack of experience of such matters, he can always make an initial approach by asking himself whether he would be equally keen on the procedure if he were spending his own money.

Remember also that few problems consist of the mysterious, so do not spend too much time looking for profundities but concentrate on a search for the elementary points which are probably lying close to hand and being overlooked. It is unnecessary in a general address such as this to discuss in detail the place of the junior in all the complicated structural parts of our industry, and reference to two technical examples must suffice. As a fuel industry we are largely responsible for obtaining the greatest yield of the products available from what is one of nature's greatest material gifts to our country—namely, coal. And do not let us forget that it is a wasting asset, so that we must, therefore, keep before us a fuel policy, and all new personnel should have that fact impressed upon them immediately they enter the industry.

This fuel policy, on the works at any rate, is largely one of efficiency, and offers extraordinary scope for the junior to prove whether he has the knowledge and ability to effect savings in such matters as fuel wasted in the carbonising process, lost in ashes, in steam raising, in the use of steam, and in various other obvious ways.

The junior should always be on the outlook for the chance to make small savings which, in the aggregate, may have considerable money value. It is also well to stress that although a man's particular bent may lead in a definite direction, he should endeavour to maintain a reasonable balance and, as

* Address to the Manchester District Junior Association of Gas Engineers, March 18, 1950.

the old saying goes, 'Know all about something and something about everything.' In this way he will be able to appreciate the impact of his work upon that of his colleagues and so avoid the criticism of dwelling in a water-tight compartment. Considerable help in maintaining this suggested balance is usually provided in modern training schemes by arranging, during his period of training, for the student to spend a certain time, say six months, in the various departments irrespective of the particular branch of the industry which he has chosen to follow ultimately.

I emphasise this because many young men, quite naturally perhaps, fail to realise that all the scientific and engineering equipment which they meet in a modern works is there not only to ensure the attainment of certain results, but to obtain those results upon a basis which is financially sound. If the results do not measure up to that standard then immediate action is demanded, and sound judgment for that action can only be expected from those who have had a sound training in basic principles and have learned to translate into practical use the application of those principles, and, finally, are able to link up the results so obtained with their commercial and financial values.

A Difficult Problem

As a second example we may take one of the most difficult problems facing the gas industry at the present time—the disposal of effluents. Apart from crude ammoniacal liquor itself, the jettisoning of which is quite indefensible from a national point of view, there are many other effluents, such as syphon liquids, oily condensates, drainage from spent-oxide dumps, all of which require to be treated, usually in a simple way, before disposal, and which provide much scope for the ingenuity of the junior technical staff. In the future, no doubt, at any rate in inland districts, the treatment of effluents from ammonia concentration and sulphate plants will have to be given deeper consideration. Incidentally, this calls to mind the necessity for the junior to make himself familiar with the various Acts and Regulations relating to the gas industry, a point which is often overlooked.

Nowadays one hears much of dephenolation, and I recollect that, so long ago as 1928, when I was President of the Yorkshire Association, that you had a paper on 'Gasworks Effluents' by Mr. W. P. Smith, when the question of dephenolation was dealt with. That not only indicates the way in which you have always endeavoured to keep your deliberations up to date, but also how slowly many processes pass from the pilot-plant stage to works scale application, and I suggest that in the future ways and means will have to be found to narrow that particular gap. In this work juniors can fit themselves for a place.

If we assume that successful efforts have been made on the works and that gas has been manufactured at an economic price into the holder, there still remain the question of distribution and utilisation to be considered if the consumer is to obtain a satisfactory service, because—and I would emphasise the point—it is the business of the gas industry to provide expert advice so that every class of consumer is enabled to make the most efficient use of gas.

There are excellent opportunities for junior members of the staff to tackle the numerous problems relating to distribution from main-laying to boosting and corrosion. Such interesting jobs present many difficulties and should not be approached in a stereotyped fashion, because each case usually has its own peculiarities which, if studied, can frequently result in either better service or saving of money, or both, in the long run. These points have been very well illustrated in some of the experiences already presented by integration and linking up of undertakings in various parts of the country.

The Small Works Manager

The position of the small works manager is a difficult one and his status varies from a practical hard-working man to young men anxious to make a start to climb the ladder. The majority do require for their undertakings technical and financial assistance which the bigger undertakings are able to give. How can the small works manager be a specialist as well as a hard worker, which he has got to be in all branches of gas practice, ranging from the retort house to the consumer, and even the book-keeping? Even when such works are closed down it will always be necessary to have a representative of the gas board in charge of depôts and distribution and utilisation, and I would leave a thought with such members of the industry that there is still a very good job for them to do, if they are energetic and keen to see that the quality of service in all its aspects to the consumer is of the highest order; in fact, we shall be short of such personnel.

I am convinced that there is goodwill on the side of the gas boards, but there must be much patience and tolerance by the men concerned. How can an area board, for example, or even a group, division, or sub-divisional manager assist a multitude of small undertakings without co-relating management and information? How can schemes be propounded for the betterment of the industry and its service without the collection of information?

Personally, I am sure that the junior, or small works manager, who has ability and drive need have no fear for the future, but the position he will attain will be the one within the limit of his capacity, and there is room for many varying types of individuals and many varying degrees of qualifications.

The Trend of the Industry

My view of the trend of the industry is that we shall see, of necessity, a large reduction in the number of manufacturing units, and that we shall see a very large growth in distribution, engineering, and utilisation. In fact we must, if we have confidence in our industry, expect distribution and utilisation to assume a much greater degree of prominence, demanding more qualified and greater numbers of men than we have in that department at the moment.

Don't forget that a distribution engineer doing, among other things, civil engineering, a physicist on development and research, and a manufacturing engineer, doing civil engineering, mechanical engineering, and chemical engineering, are all gas engineers. The field of gas engineering is very wide, and each man should decide for himself for which field he is most fitted, and have confidence that ability and integrity are the surest ways to bring a man into prominence.

With reference to utilisation, it is well known that the magnitude of the industrial gas load varies considerably in different areas, as one would naturally expect it to do, but it still represents only a small proportion of what it could be, and of what it will have to be in the future if gas prices are to be kept comparatively low. For this reason and works integration, distribution engineering is bound to assume greater importance than it does today. I would hasten to say that your area provides an excellent example of what can be done with gas in the industrial field, but I merely use the illustration to indicate that there is plenty of room for industrial gas engineers who have a sound knowledge of the numerous factors involved. At the present time the gas industry is looked upon as a two-fuel industry and the important question of coke must have consideration. We could spend considerable time discussing this matter but, as a day-to-day procedure, the junior can do much to help with this apparently uninteresting matter in the control of moisture content and sizing, both of which can have a profound effect upon the coke market.

The New Situation

Nationalisation will not necessarily provide automatically a large number of comfortable jobs. The race will still be to the strong, and education should be interpreted in its widest sense. The junior of today, in the midst of his studies, must realise that, in industry, satisfactory results can now only be obtained by the efforts of well co-ordinated teams and, therefore, he must cultivate the ability to work with others and be prepared to take a broad and generous

view of their work. Such a long-term view pays good dividends because many who have complained that years spent at study have not brought them good posts and commensurate salaries could, by self-examination, have discovered the reason of their own outlook and lack of ability to interpret technical knowledge.

In the modern world a man cannot make satisfactory progress by book-learning alone; he must cultivate the power to co-operate and, particularly in his early days, must learn to obey before he can command.

In his contacts with the workmen operating plant and carrying out processes he must realise that while they may not be deeply versed in the theoretical aspects of their work they are usually quick to detect a lack of knowledge in others. To be a leader he has to discipline those he would lead by his own personal knowledge, conduct, and example. This he can do only by having a well-stocked mind to fall back upon when conditions are difficult and grim.

Finally, since it has been decided that the gas industry should be nationalised, we have to realise that loyalty to our profession and to our colleagues has assumed perhaps an even greater significance than formerly.

DISCUSSION

The **President** (Mr. R. J. Bradshaw, St. Helens) opened the address to discussion.

Mr. **J. Hargreaves** (Bradford, President of the Yorkshire Junior Gas Association) raised a point in regard to propaganda in schools. He knew of a boy attending a school who was very enthusiastic in regard to gas practice. He was regarded as being more or less of a freak for wanting to go into the gas industry at all. A large percentage of the boys in the school were studying electrical engineering, general engineering, chemical engineering, and so on. Therefore, he felt there was considerable scope in schools for propaganda in respect to gas practice.

Mr. **Chester** considered that the boy would probably be far better off by entering the gas industry. There was a shortage of properly-trained technical personnel. It was the responsibility now of the Gas Council and the areas boards to promote education in that direction. There had been a most excellent book published by the Institution relating to careers in the gas industry. It had been sent to all public schools and was available to all gas undertakings and public libraries, as well as being placed in the hands of science masters and head masters. A study of that book was to be highly commended.

Mr. **H. N. Dann** (Blackburn) said the general view was that the present time was an era of the specialist; that the man with the University degree was going to come into the industry. This was important from the point of view of the young man who had already perhaps served four, five, or six in the industry, and whose possibilities and opportunities of taking a degree were limited. He might attempt to take an external degree which probably was not worth very much when he received it.

Mr. **Chester** replied that a great deal depended on the interpretation of the term 'specialist.' It was loosely used. A distribution foreman was a specialist in his knowledge of handling men, and he was acquainted with the special jobs of fitting gas equipment. They still required that type of specialist who, thank goodness, was prevalent in the industry —the man who knew how to handle a retort house and to adjust the retort setting. Much depended on the size of the unit as to whether a specialist was necessary, but even if he was a specialist he still remained a gas engineer. There were opportunities for young men who would qualify under the Institution scheme and the amended scheme drawn up in conjunction with the Civils. There was a considerable sphere in the larger works, but, as he had tried to say in his address, there was a much bigger field in regard to the utilisation and distribution. Personally, in his own particular sphere, he had been astonished to find a number of people who had no idea how to calculate the size of a gas main, or even to calculate the potential load on a gas main. A man who could do so was a type of person who might be termed a specialist, but he was in short supply.

Mr. **W. T. Hainsworth** (Newton-le-Willows) asked if Mr. Chester considered that at the present time opportunities for moving round the country were as great as they used to be.

Mr. **Chester** thought there had been no alteration in the process of movement. A man would appear to be appointed to a job for which he was most suited.

Sir **Frederick J. West,** G.B.E. (West's Gas Improvement Co., Ltd., Manchester) remarked that the difficulty of getting people into industry was not peculiar to gas; it applied to other branches as well. One regretted the trend for young men to enter what might be termed the collar and black coat jobs and to sit at a desk. There was difficulty in attracting the right sort of youths to become apprentices in the engineering industry. Then again there was a great shortage of people who were endowed with the talent for leadership. He had experienced this factor in many spheres. Even college professors who possessed great technical knowledge sometimes failed in that way; they were unable to co-operate with others and lead them. There was, of course, no text-book for instruction in that direction, and his advice to them was to study the methods of successful people, to try to understand how they got on, to understand how they achieved the end they had in view even though they might not have any Grade A technical knowledge. It would be found that such men had the capacity to work with and co-operate with others, and to stimulate them into following the path they themselves intended to follow—in short, they were leaders of men.

The **President** gathered from Mr. Chester's address that the importance of the junior associations was as great at the present time as it was at the time of their inception. The Manchester Association, in particular, was brought into being in order to remove any feeling of isolation that might prevail among the members of the profession. Education was its primary object. Mr. Chester had pointed out the necessity for broadening their knowledge in the gas industry, and personally he would suggest that the time was never more opportune. A junior thought twice nowadays before he contemplated moving from his present undertaking, particularly if he was married. There were such matters as housing, education of children, &c., to be considered, so that the gas engineer did not like to go very far afield or to leave a good educational centre. In regard to the tendency for technical people to shun the industry, as Mr. Chester had said, there was a great shortage of technical men with good practical knowledge. The junior associations had grown tremendously, and he thought the Manchester Junior Association in particular were very wise when they definitely tightened the strings of entry. It was a wise policy to maintain a high standard of education.

Mr. **John Wilson** (General Manager, Manchester Group), proposed a vote of thanks to Mr. Chester for his address.

JOINT CONSULTATION

The Ministry of Labour has published a supplement to its *Industrial Relations Handbook*, dealing specifically with the subject of joint consultation. The supplement, which can be obtained from H.M. Stationery Office, price 2s., has been divided into four sections, the first of which comprises a record of the action taken by the Government to promote the practice of joint consultation. The second part explains the steps taken by the national organisations in each industry, and the third section provides examples of national industrial agreements relating to the establishment of joint consultative machinery and of model constitutions for joint consultative or works committees where recommended by the national organisations. The final part of the supplement includes details of agreements which have been arrived at in nationalised industries for the establishment of joint consultative machinery. The document lays careful emphasis on the fact that 'the conception of joint consultative machinery between management and workers at factory level is not new,' and also points out that the extent to which joint consultation is practical varies from firm to firm. The Government's aim, it is stated, is to secure a rapid development throughout the field of industry so that what is now the practice in some firms may become the practice of all. In so doing, care has been taken to safeguard the position of the employers' associations and trade unions, and the existing machinery of negotiation and consultation.

The American Gas Association reports that utility sales of gas during 1949 reached 35,523 mill. therms, equivalent to a rise of 9.5%, compared with sales of 32,451 mill. therms during 1948. Natural gas sales advanced 11.2%, rising to 32,090 mill. therms, while manufactured gas sales were 3.6% lower, falling to 2,265 mill. therms and sales of mixed gas declined 6.6% to 1,168 mill. therms.

THE VOLATILE CONTENT OF COKE*

By R. HODGSON, Assoc.M.Inst.Gas E.,
Bradford Gas Undertaking.

TWO methods are available for estimating the amount of volatile matter left in coke. First, the modification of the normal volatile matter test for coals, and secondly a test for the thermal value of this residual volatile matter.

The only published evidence on the volatile therm content of coke appears to be in two publications—*viz.*, 'The Solid Products of Carbonisation,' a monograph on work carried out by the former South Metropolitan Gas Company on coke, and the paper by Dr. F. R. Weston, of the former Gas Light & Coke Company, on carbonisation in vertical retorts 'The Bow Common Experiment, 1945-46.' The test method is described in B.S.S. 1016/1942, and in 'Solid Products of Carbonisation.'

The apparatus consists of a silica tube of 7-8 mm. I.D. and 310 mm. long which contains the coke sample. It is closed at one end and connected at the other via a two-way tap to a glass bulb of 150 ml. capacity which may be put under full 760 mm. mercury vacuum by lowering a mercury reservoir. The other leg of the two-way tap is connected to some form of gas analysis apparatus in which CO_2 and N_2 may be estimated. The silica tube is placed inside a further silica tube forming part of a furnace which can be rapidly raised to 1,100°C. The temperature is measured by a rate-metal thermocouple alongside the coke tube.

Test Method

In the test 2 gm. of coke ground to pass a 72 mesh and dried are weighed into the tube. The apparatus is connected up and the furnace slowly raised to 500°C. The temperature is kept at 500°C. while the tube and connections are evacuated and the gases so obtained are discarded. The temperature is then raised to 1,100°C. within 9 to 10 min., allowing the gas evolved to pass to the evacuation bulb. The temperature is held constant at 1,100°C. for 5 min., and then allowed to fall to 800°C. when the tube is again thoroughly evacuated and all the gas removed above 500°C. is passed to the gas analysis apparatus. The fact that this gas contains only traces of any gas other than CO_2, CO, H_2, and N_2 is utilised in analysis.

The gas is measured after absorption of CO_2 and then the residue after combustion or explosion and re-absorption in NaOH is measured. The difference in normal cases is all CO or H_2 and a C.V. of 320 may be taken. The volumes should be corrected for temperature and pressure.

Volatile therms per ton of coke equals cc. of combustible $(CO + H_2) \times 0.0574$. The accuracy is plus or minus 0.05 therm per ton and the results are not absolute but comparative.

The data given in the South Metropolitan monograph is for horizontal cokes and a figure of 2.0 to 2.5 therms per ton is stated as a minimum for good domestic coke. In the Bow Common experiment the normal volatile therm content of continuous vertical coke is stated as 5 to 6 therms per ton.

We are interested in this from both a carbonisation and a coke production viewpoint. Was it possible to get any more therms per ton from the coke? The plant was being worked at high throughputs and it was feared that incomplete carbonisation might be to some extent occurring.

Samples taken at random from the four benches of Woodall-Duckham continuous vertical retorts at Bradford showed that the ordinary V.M. tests give only the vaguest indication of the actual combustible gases present. The analysis and calorific values of the residual gases vary considerably—*e.g.*:

CO_2	3	1.5
$CO + H_2$	41	81
N_2	56	17.5
Calculated C.V.	140	260

Both these samples had a volatile matter content of 2.5 to 2.6%, yet due to the difference in composition and thus of calorific value of the residual gas the volatile therm contents were 2.5 and 4.65 respectively.

The gases evolved from either are of very poor quality and in the case of steamed vertical retorts would be of little value. It would be far better to leave some few therms in the coke where they would be of value and make them up in the gas by steaming. To attempt recovery means either lowering the throughput or raising the heats. Neither of these suggestions is generally possible under present conditions when plants are working at maximum output often at the expense of some loss in yield and heats are worked at as high a figure as is feasible without deterioration of refractories.

The things a housewife probably notices most readily with coke burning in an open grate, are:—

1. The time taken for the fire to ignite—the ignitability.
2. The accumulation of ash in the grate.
3. Whether the fire burns readily once ignited.

The ignitability may be tested either in an open fire or by some laboratory apparatus. In the open fire method the amount of gas to give some standard state of the fire may be measured, or, as is more usual, a standard amount of gas or wood may be used for ignition, and the state of fire, say in one hour, observed.

The laboratory type test is best represented by the Critical Air Blast where the air velocity needed to keep a previously ignited coke sample just alight is measured. The results of these two types of test may be closely correlated. The factors governing the ignitability in an open fire are moisture, sizing, and, probably most important, is the volatile therm content. The South Metropolitan Gas Company have shown that for horizontal cokes the ignitability, though not combustibility, was governed largely by the volatile therm content, and the same is true for any set of cokes of similar history. By combustibility I mean here the burning of the coke after ignition, and this is affected more by ash, grading, &c.

The C.A.B. and volatile therm content when graphed give a group of curves whose position depend on bulk density and ash. For differing coals carbonised in different types of retorts the amount of residual therms required to provide a similar coke must vary considerably.

Varying Conditions

It is evident that for coke produced from highly swelling coals in horizontal retorts a larger number of volatile therms will be required than for a coke produced by carbonising a low swelling coal in continuous vertical retorts, if a coke of similar initial ignitability is to be produced.

The admixing of some fuel of higher volatile therm content with one of low gives, if the pieces are sufficiently well mixed, practically the same effect as if the volatile matter were evenly distributed through the coke. This it to be expected since if pieces are picked at random from a coke sample the volatile therm contents will usually be found to have maximum spot values well above the mean value found from an average sample—*e.g.*, for samples with average value of about 3, some pieces contain up to 15 therms per ton.

The well known fact that partly burnt coke if collected will light a fire more readily than fresh coke, however well dried, is an obvious exception to the general statement that the higher the volatile therms the easier to ignite is a coke. For example, a sample of coke partially burnt in this manner was found to have an increased ignitability, but the volatile content controls the ignitability as in open fires, and also is bility must be due to a change in structure caused by the opening up of closed pores in the coke mass.

In the case of closed stoves, boilers, &c., the volatile therm content controls the ignitability as in open fire, and also is the determinative factor in the flexibility and slow burning capacity of the coke.

This importance of volatile therm content in closed com-

* Paper to the Yorkshire Junior Gas Association, February 8, 1950.

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bustion of the coke is to be expected from its effect on critical air blast. It is, of course, quite possible that ash content may over-ride this controlling effect, but it is interesting to note that in some cases a rise in ash content may increase the coke ignitability, and its slow burning capacity. This presumably is due to the catalysis by ash, probably of an alkaline character, on similar lines to the coke activation method using soda-ash.

The importance of volatile matter content measured in therms per ton is obviously one of some importance to both the producer and the user of coke. Both want as much of these volatile therms as is possible, one in the gas and the other in the coke. This balance of opposing requirements of the carbonising staff who are anxious to produce as high a make per ton as possible, under sometimes rather adverse conditions, and the requirements of the people who must sell the coke, which is not now so easily disposed of as during the war when fuel supplies were so short, is one of some difficulty and can only be really settled by tests, measurements, and careful scientific control.

The necessity of standardising and controlling the quality of coke in regard to water content, grading, and ash content, so far as this is possible under present coal supply conditions has been stressed considerably. Much of such control may be nullified if the volatile therm content is not also closely watched.

DOMESTIC HOT WATER

IN the *Journal* of February 1 we published a paper on this subject by Mr. J. E. Cooper, Technical Manager (Potterton Gas Division), Thomas De La Rue & Co., Ltd., to the Eastern Junior Gas Association. The following is a report of the discussion which took place at the meeting.

The **President** (Mr. J. T. Brookes) said that Mr. Cooper had mentioned the question of water shortage and houses which were now being built with baths. The question could be viewed in two aspects, as being accelerated by the extremely low rainfall and by people going from houses where they had one cold tap for every six houses, to those with four, five and six taps to every house. He went on to ask if it would be possible to estimate the total water requirements when the whole population was educated sufficiently to use 150 gall. of hot water per week. The author, he continued, had raised an important point in regard to installation and maintenance fitters. He personally agreed that the skill of the maintenance fitter in the technical details of appliances should be as great as, if not greater than, that of the installation fitter. The gas industry was in a transitional stage and it was true to say that the gasfitter of today had to acquire more and more the skill of a watchmaker. The industry was doing what it could to educate younger fitters to present-day standards and he felt that in many respects nationalisation offered greater advantages in the technical training of the fitting staff. In regard to storage heaters, he held the opinion that this type of heater with a higher rate of recovery was the one which provided the consumer with the best hot water service.

Mr. **Cox** (Norwich), speaking of the quantity of hot water used by the average family, remarked that he had taken readings on his own installation at his home, and had obtained some figures, all recorded by check meters, which appeared colossal when compared with the Egerton standard. The total quantity of hot water used in one week was 434 gall., just over 62 gall. per day. The total gas consumed was 1,630 cu.ft. per week. The number of adult baths taken was six, the younger child had a bath each morning, and the elder child had a bath each evening. The installation was under no other control than thermostatic. At 6s. 3.9d. per 1,000 cu.ft. the weekly cost was 10s. 4d. which worked out at 0.2856d. per gall. (3.755 cu.ft. per gall.). The overall efficiency was 42.25%. Advocating the use of clock control, he said that with the same installation on clock control, and equipped with a bulk/small economy valve, there was a saving of 27.54% on running costs. The clock control was set to switch on at 6.15 a.m. and off at 6.15 p.m. The 'Economy' valve was set at 'small' all day, but was turned to 'bulk' one hour before each bath and then turned to 'small' at the time a bath was taken—the clock control being by-passed for one hour. The cost per gall. of hot water was 0.2065d. (2.722 cu.ft. per gall.) and this installation had an overall efficiency of 58.29%. Much economy was effected by having no maintenance rate on the clock control, only one small pilot flame. With storage water heaters, the tendency should be for the thermostat to cut right out, not down.

Mr. **R. W. Hilham** (Colchester) gave figures of his own installation for a family of three which did not agree with those of Mr. Cox. He stated that measured water and gas consumptions over a period of six months averaged 223½ gall. and 1,100 cu.ft. per week respectively. The average gas consumption per gall. worked out at 4.9 cu.ft. An interesting feature of this installation was the fact that a circulator having an output of 5½ gall. per hour was used with a 30 gall. storage cylinder, and ample hot water was available at all times. The circulator had a gas rate of 6,000 B.Th.U. per hour and Mr. Hilham tried to use it in an airing cupboard without a direct coupled flue, with, however, unfortunate results. It was next tried with ventilation into roof space, but under winter conditions this also was unsatisfactory due to excessive condensation. He asked if any reason could be assigned to the varied action of scale reducers. He had recently had trouble with loose scale blocking the outlet of a boiling water machine used on the first floor, whereas an exactly similar installation, on the same water supply, but installed on the ground floor, gave no trouble. He felt that insufficient effort had been made to modernise the single-point water heater, as this, together with the sink heater, was, in his opinion, the best means for obtaining hot water for the lower income group. His experience showed that this type of heater was most economical from the angle of maintenance.

Mr. **A. Collinson** (Peterborough) referred to a large installation comprising 3/6 section No. 3 series Potterton boilers, supplying central heating and domestic hot water through a calorifier, and asked what would be the saving by installing clock control, say from 10 p.m. to 6 a.m. He referred to Mr. Cooper's suggestions that the Government policy was to install back boilers, and he would like the authority for this statement, as he pointed out that their undertaking covered several local authorities and this had not been the position in their area, as one estate was fitted throughout with Ascot multi-point heaters.

Mr. **H. R. Stanley** (Cambridge) asked for Mr. Cooper's comments as to a fair average C.V. for coke as found on the district, based on his practical experience rather than on theoretical formulæ.

Mr. **Cooper,** in reply, said that the saving resulting from installation of a clock controller under the conditions given by Mr. Collinson could be up to 15% of total gas used. The information regarding back boilers in Peterborough was interesting and encouraging. Using 'high-low' control, the 60 cu.ft. per hour circulator would probably consume more gas than that consuming 30 cu.ft. per hour, for the same usage, but the former appliance, with its higher recovery rate, can give a superior service. If 'on-off' working was used the difference in running cost as between the two circulators would tend to be lower than for 'high-low.' It was agreed that, other things being equal, increase in thermal efficiency tended to increase the rate of corrosion and, therefore, in general maintenance costs. But with increasing cost of gas it became particularly important to consider design efficiency. The development of a simple appliance was certainly desirable. Replying to Mr. Stanley, a range of 10,000-11,000 B.Th.U./lb. was a reasonable C.V. for coke at the present time. Mr. Hilham's remarks served to show that circulators of comparatively low gas rate could give adequate service. His experience of flueless working in an airing cupboard indicated at least some of the troubles that could be experienced. But it was disappointing to hear that roof space termination led to excessive condensation. This latter method had been used with success, but good ventilation of the space itself appeared vital to success. Variation in performance of scale reducers was possible as between one water and another, but it might be that in the installations cited, one heater was being used more than the other. He agreed with Mr. Hilham's remarks regarding the efficacy of the single-point bath heater. It was not possible for him to give the answer to Mr. Brookes's query regarding the possible increase in water usage were each average household (four persons) to consume 150 gall. of hot water in addition to other requirements, but he suggested that this increase would be large.